A member of the
Avery Weigh-Tronix Group

Model 350I.S. and Model 355I.S.

Instrinsically Safe Indicator Series

Service Manual

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1 General Information and Warnings

1.1 About this Manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1 and 1.1 headings shown above. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Text Conventions

Key names are shown in brackets e.g. [PRINT] and reflect the case of the key being described. This applies to the keys on the indicator keypad.

Displayed messages appear in *italic* type and reflect the case of the displayed message.

1.1.2 Special Messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.

DANGER!
THIS IS A DANGER SYMBOL.
DANGER MEANS THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES WILL CAUSE INJURY OR DEATH.

ELECTRICAL WARNING!
THIS IS AN ELECTRICAL WARNING SYMBOL.
ELECTRICAL WARNINGS MEAN THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES MAY RESULT IN ELECTROCUTION, ARC BURNS, EXPLOSIONS OR OTHER HAZARDS THAT MAY CAUSE INJURY OR DEATH.

WARNING!
This is a Warning symbol.
Warnings mean that failure to follow specific practices and procedures may have major consequences such as injury or death.

CAUTION!
This is a Caution symbol.
Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2 Installation

DANGER: RISK OF ELECTRICAL SHOCK. NO USER SERVICEABLE PARTS. REFER TO QUALIFIED SERVICE PERSONNEL FOR SERVICE.

1.3 Electrical Installation

CAUTION: The AC to DC Power Supply power cable must be connected to an earth-grounded electrical outlet. The electrical supply must have a circuit breaker with an appropriate rating to protect from over-current conditions.

For your protection, all electrical (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused power source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

1.3.1 Pluggable Equipment

Pluggable equipment must be installed near an easily accessible socket outlet.

1.3.2 Permanently Wired Equipment - Isolator Requirements

Permanently connected equipment must have a readily accessible disconnect device incorporated in the fixed wiring such as an isolator or circuit breaker with at least 3mm contact separation.

The mains supply to the weighing equipment MUST be protected by a 4000A breaking capacity fuse of a suitable current rating (a suitable fuse is a 3A Bussmann type TDC180). These fuses are usually of the sand filled type.

The isolator **MUST NOT** be installed into the flexible power cable supplied with the unit.

1.3.3 Safe Handling of Equipment with Batteries

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

ATTENTION: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie, remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1.3.4 Wet Conditions

Under wet conditions, the plug must be connected to the final branch circuit via an appropriate socket / receptacle designed for washdown use.

Installations within the USA should use a cover that meets NEMA 3R specifications as required by the National Electrical Code under section 410-57. This allows the unit to be plugged in with a rain tight cover fitted over the plug.

Installations within Europe must use a socket which provides a minimum of IP56 protection to the plug / cable assembly. Care must be taken to make sure that the degree of protection provided by the socket is suitable for the environment.

1.4 Routine Maintenance

IMPORTANT: This equipment must be routinely checked for proper operation and calibration.
Application and usage will determine the frequency of calibration required for safe operation.

Always turn off the machine and isolate from the power supply before starting any routine maintenance to avoid the possibility of electric shock.

Make sure that it is placed securely on a flat and level surface.

1.5 Cleaning the Indicator

Table 1.1 Cleaning DOs and DON'Ts

DO	DO NOT
Wipe down the outside of standard products with a clean cloth, moistened with water and a small amount of mild detergent	Attempt to clean the inside of the indicator
	Use harsh abrasives, solvents, scouring cleaners or alkaline cleaning solutions
Spray the cloth when using a proprietary cleaning fluid	Spray any liquid directly on to the display window

1.6 Training

Do not attempt to operate or complete any procedure on a indicator unless you have received the appropriate training or read the instruction books.

To avoid the risk of RSI (Repetitive Strain Injury), place the indicator on a surface which is ergonomically satisfactory to the user. Take frequent breaks during prolonged usage.

1.7 Sharp Objects

Do not use sharp objects such as screwdrivers or long fingernails to operate the keys.

1.8 FCC and EMC Declarations of Compliance

United States

Table 1.2

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

Table 1.3

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

European Countries

Table 1.4

WARNING: This is a Class A product. In a domestic environment, this product may cause radio interference in which the user may be required to take adequate measures.

2 Introduction

This section explains the different intrinsically safe approvals and guidelines, keypad functions, and the types of displays offered.

2.1 Hazardous Area Guidelines

The GSE Models 350 I.S. and 355 I.S. instruments are approved by FM Approvals, ATEX and CSA as intrinsically safe for use in hazardous areas. An intrinsically safe device has been proven through calculation and testing that it cannot produce enough electric or thermal energy under normal or fault conditions to cause ignition of flammable material present in the atmosphere.

The hazardous area is defined in terms of how long the hazard is present (material presence), what type of flammable material is present (apparatus), and what maximum temperature can be present (maximum surface temperature). Refer to Table 2.1 for details on class, division, zone, and temperature classifications.

Table 2.1 Hazardous Location Classifications (USA)

Classification IEC, Cenelec	NEC 505 CodesNEC 500	CSA Codes
Material Presence		
Continuously Present	Zone 0	Division 1
Intermittently Present	Zone 1	Division 1
Abnormally Present	Zone 2	Division 2
Apparatus		
Gas & Vapors		
Acetylene	Group IIC	Class I/Group A
Hydrogen	Group IIC	Class I/Group B
Ethylene	Group IIB	Class I/Group C
Propane	Group IIA	Class I/Group D
Methane	Group I	N/A
Dust		
Metal	N/A	Class I/Group E
Coal	N/A	Class I/Group F
Grain	N/A	Class I/Group G
Fibers (All)	N/A	Class III

Classification IEC, Cenelec	NEC 505 CodesNEC 500	CSA Codes
Maximum Surface Temperature		
450 °C	T1	T1
300 °C	T2	T2
280 °C	-	T2A
260 °C	-	T2B
230 °C	-	T2C
215 °C	-	T2D
200 °C	T3	T3
180 °C	-	T3A
165 °C	-	T3B
160 °C	-	T3C
135 °C	T4	T4
120 °C	-	T4A
100 °C	T5	T5
85 °C	T6	T6

Class I, Division 1, Groups A, B, C & D

Class I, Division 1 locations are those in which hazardous concentrations of flammable gases or vapors exist continuously, intermittently or periodically under normal operating conditions. Electrical equipment for use in such locations may be "explosion proof," "intrinsically safe," "purged" or otherwise protected to meet the intent of Articles 500 of the National Electrical Code®.

Explosion proof protection consists of equipment designed to be capable of containing an internal explosion of a specified flammable vapor-air mixture. In addition, the equipment must operate at a safe temperature with respect to the surrounding atmosphere.

Intrinsically safe electrical equipment and associated wiring are incapable of releasing sufficient electrical or thermal energy to cause ignition of a specific hazardous material under "normal" or "fault" operating conditions. Normal operation assumes maximum supply voltage and rated environmental extremes; fault conditions assume any single or dual independent electrical faults plus field wiring open, shorts or connections to ground. Equipment rated as intrinsically safe is recognized by Article 500 as safe for use in hazardous locations without special enclosures or physical protection that would otherwise be required.

Purged systems have fresh air or an inert gas under positive pressure to exclude ignitable quantities of flammables from the electrical equipment enclosure.

Equipment Approved for Division 1 locations shall be permitted in Division 2 locations of the same class, group and temperature class.

Class I, Division 2, Groups A, B, C & D

Class I, Division 2 locations are those in which hazardous concentrations of flammables exist only under unlikely conditions of operation. As such, equipment and associated wiring which are incapable of releasing sufficient electrical and thermal energy to ignite flammable gases or vapors under "normal" operation and environmental conditions are safe to use in Class I, Division 2 locations.

Class I, Zone 0, Groups IIC, IIB & IIA

A Class I, Zone 0 location is a location (1) in which ignitable concentrations of flammable gases or vapors are present continuously; or (2) in which ignitable concentrations of flammable gases or vapors are present for long periods of time. Electrical apparatus for use in such locations may be type of protection "ia" Intrinsic Safety.

Class I, Zone 1, Groups IIC, IIB & IIA

A Class I, Zone 1 location is a location (1) in which ignitable concentrations of flammable gases or vapors are likely to exist under normal operating conditions; or (2) in which ignitable concentrations of flammable gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or (3) in which equipment is operated or processes are carried on, of such a nature that equipment breakdown or faulty operations could result in the release of ignitable concentrations of flammable gases or vapors and also cause simultaneous failure of electrical equipment in a mode to cause the electrical equipment to become a source of ignition; or (4) that is adjacent to a Class I, Zone 0 location from which ignitable concentrations of vapors could be communicated, unless communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided. Electrical apparatus for use in such locations may be type of protection "d" Flameproof, "e" Increased Safety, "ib" Intrinsic Safety, "m" Encapsulation, "o" Oil Immersion, "p" Pressurized or "q" Powder-Filled.

Note: Electrical apparatus Approved for use in Class I, Zone 0 locations shall be permitted in Class I, Zone 1 locations of the same gas group and temperature class.

Class I, Zone 2, Groups IIC, IIB & IIA

A Class I, Zone 2 location is a location (1) in which ignitable concentrations of flammable gases or vapors are not likely to occur in normal operation and if they do occur will exist only for a short period; or (2) in which volatile flammable liquids, flammable gases or flammable vapors are handled, processed or used, but in which the liquids, gases or vapors normally are confined within closed containers or closed systems from which they can escape only as a result of accidental rupture or breakdown of the containers or system or as the result of the abnormal operation of the equipment with which the liquids or gases are handled, processed or used; or (3) in which ignitable concentrations of flammable gases or vapors normally are prevented by positive mechanical ventilation, but which may become hazardous as the result of failure or abnormal operation of the ventilation equipment; or (4) that is adjacent to a Class I, Zone 1 location, from which ignitable concentrations of flammable gases or vapors could be communicated, unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided. Electrical apparatus for use in such locations may be type of protection "nA" Non-Sparking, "nC" Protected contacts, "nR" Restricted Breathing or "p" Pressurized.

Note: Electrical apparatus Approved for use in Class I, Zone 0 or Zone 1 locations shall be permitted in Class I, Zone 2 locations of the same gas group and temperature class.

Class II, Divisions 1 & 2, Groups E, F & G

Electrical equipment suitable for use in Class II locations, as defined by the National Electrical Code®, is constructed to exclude ignitable amounts of dust from the equipment enclosure. Approved equipment of this type has also been evaluated to assure that hazardous surface temperatures do not exist. Equipment listed as suitable for Class II locations is "dust-ignition proof" or otherwise designed to meet the intent of Articles 500 and 502 of the National Electrical Code®.

Class III, Divisions 1 & 2

Class III locations are those which are hazardous because of the presence of ignitable fibers or flyings. Equipment listed for installation in Class III locations is designed to exclude the fibers and flyings from the equipment enclosure and to function without developing excessive surface temperatures.

2.1.1 Definitions

Associated Apparatus - Apparatus, including Category ia and ib apparatus, in which the circuits are not necessarily intrinsically safe themselves, but which affect the energy in the intrinsically safe circuits and are relied upon to maintain intrinsic safety. Associated electrical apparatus may be either:

a) Electrical apparatus that has an alternative type of protection for use in the appropriate potentially flammable atmosphere; or

b) Electrical apparatus not so protected and thus not suitable for use in a potentially flammable atmosphere.

Control Drawing - a drawing or other document provided by the manufacturer of the intrinsically safe or associated apparatus that details the allowed interconnections to other circuits or apparatus. If the intrinsi-cally safe or associated apparatus is investigated under the entity concept, the control drawing will include the applicable electrical parameters to permit selection of apparatus for interconnection.

Entity Evaluation Concept - a method used to determine acceptable combinations of intrinsically safe apparatus and connected associated apparatus that have not been investigated in such combination.

Hazardous (Classification) Location - a location in which fire or explosion hazards may exist due to an explosive atmosphere of flammable gases or vapors, flammable liquids, combustible dust, or easily ignitable fibers or flyings.

Intrinsically Safe Circuit - a circuit in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under the test conditions prescribed in this standard, of causing ignition of a mixture of flammable or combustible material in air in the mixture's most easily ignited concentration.

Nonincendive Circuit - a circuit, other than field wiring, in which any arc or thermal effect produced under intended operating conditions of the equipment is not capable, under specified test conditions, of igniting the flammable gas-air, vapor-air, or dust-air mixture.

2.1.2 Entity Evaluation Concept

The Model 350 I.S. and 355 I.S. indicators have been approved under the entity evaluation concept, which allows the interconnection of intrinsically safe devices in hazardous areas even though these devices were not specifically approved in this combination. This means that not only can the instrument be used with Avery Weigh-Tronix FM Approved loadcells and peripherals, but they can also be used with any manufacturer's FM Approved loadcells and peripherals provided that they have matching entity ratings and are approved for the appropriate hazardous area.

The criteria for interconnection is that the maximum input voltage and current, which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal to or greater than the maximum output voltage and current levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum internal capacitance and inductance of the intrinsically safe apparatus, including interconnecting wiring, must be less than or equal to the maximum allowed capacitance and inductance which can be safely connected to the associated apparatus. If these criteria are met, then the combination may be connected and remain intrinsically safe. If the specific capacitance and inductance ratings of the wiring are unknown, use a capacitance of 60pF/ft and an inductance of 0.2uH/ft.

When connecting a Model 350 I.S. or 355 I.S. to another intrinsically safe device, the entity ratings must be compared and satisfy the conditions shown in the following table.

2.1.3 Entity Rating Definitions

Voc or Uo - the maximum open circuit voltage that may be present at the specified terminals

Isc or Io - the maximum short circuit current that may be present at the specified terminals

Ca or Co - the maximum capacitance that may be connected to the specified terminals

La or Lo - the maximum inductance that may be connected to the specified terminals

Po - the maximum output power from the specified terminals

Lo/Ro - inductance to resistance ratio that indicates the maximum inductance per ohm of resistance that can be connected to the specified terminals

Vmax or Ui - the maximum voltage that may be connected to the specified terminals

Imax or Ii - the maximum current that may be connected to the specified terminals

Ci - the capacitance present at the specified terminals

Li - the inductance present at the specified terminals

Pi - the maximum power that may be supplied to the specified terminals

Li/Ri - the maximum internal inductance to resistance ratio at the specified terminals

350I.S. / 355I.S. Indicator	Condition	Intrinsically Safe Device
Voc	<=	Vmax or Ui
Isc	<=	Imax or Ii
Ca	>=	Ci + cable capacitance
La	>=	Li + cable capacitance
Po	<=	Pi

2.1.4 Entity Ratings

350 / 355 I.S. Indicators and Options							
Terminal	**Description**	**Voc (V)**	**IO, Isc (mA)**	**Po * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
J8	Comm 1 & 2 (RS-232)	7	50	87.5	15.4	13.7	A-G, IIC-IIA
J11	Remote Keys	7	62	109	15.4	9	A-G, IIC-IIA
J5	Remote Display	7	50	87.5	15.7	13.7	A-G, IIC-IIA
J10	Loadcell (5V EXC)	7	400	700	8.3	198	A-G, IIC-IIA
J10	Loadcell (8V EXC)	14	400	1400	4.6	945.2	C-G, IIB-IIA

Terminal	Description	Ui, Vmax (V)	Ii, Imax (mA)	Pi * (W)	Ci (µF)	Li (mH)
J8	Comm 1 & 2 (RS-232)	7	50	1.55	0	0

M4542 Entity / Nonincendive Field Wiring Parameters					
Terminal	**Vmax (V)**	**Imax (mA)**	**Pi (W)**	**Ci (µF)**	**Li (mH)**
Indicator (J1)	14	400	1.4	0	0
Terminal	**Voc (V)**	**ISC (mA)**	**Po (W)**	**Ca (µ F)**	**La (mH)**
Load Cell (J2-5)	14	400	1.4	0.73	0.2

ITA Entity Parameters				
Vmax (V)	**Imax (mA)**	**Pi (W)**	**Ci (µF)**	**Li (mH)**
21.1	400	1.2	0	0

Floating Beam Entity / Nonincendive Field Wiring Parameters				
Vmax (V)	**Imax (mA)**	**Pi (W)**	**Ci (µF)**	**Li (mH)**
30	600	1.4	0	0

2.2 Factory Mutual Approval US (Indicators and Options)

The Model 350 I.S. and 355 I.S. indicators and options have been approved for the following hazardous areas:

Factory Mutual Project Identifier: 3018357

2.2.1 350IS Weight Indicator

IS / I, II, III / 1 / ABCDEFG / T4 Ta=50 °C - 41533; Entity;

I / 0 / AEx ia IIC / T4 Ta=50 °C - 41533; Entity; NI / I / 2 / ABCD / T4 Ta=50 °C - 41533;

NI / I / 2 / IIC / T4 Ta=50 °C - 41533; S / II, III, / 2 / FG / T4 Ta=50 °C - 41533;

Entity / Nonincendive Field Wiring Parameters						
Terminal	**Voc (V)**	**IO, Isc (mA)**	**Po * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
Remote Display J5	7	50	87.5	15.7	13.7	ABCD
Communication (J8)	7	50	87.5	15.7	13.7	ABCD

Entity / Nonincendive Field Wiring Parameters						
Terminal	**Voc (V)**	**IO, Isc (mA)**	**Po * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
Remote Key Input (J11)	7	62	109	15.4	9	ABCD
Terminal	**Vt (V)**	**It (mA)**	**Pt * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
Load Cell (J10)	7	400	700	8.3	198	ABCD
Load Cell with alternate excitation option (J10)	14	400	1400	4.6	945.2	CD

Special Condition of Use:

When fitted with an alternate Excitation Output Board P/N 420982-0364, the 350IS is not to be used in a Class I, Division 1, Group A and B or Class I, Zone 0, Group IIC Hazardous (Classified) Location as shown on Control Drawing 41533 sheet 2.

2.2.2 355IS Weight Indicator

IS / I, II, III / 1 / ABCDEFG / T4 Ta=50 °C - 41533; Entity;

I / 0 / AEx ia IIC / T4 Ta=50 °C - 41533; Entity; NI / I / 2 / ABCD / T4 Ta=50 °C - 41533;

NI / I / 2 / IIC / T4 Ta=50 °C - 41533; S / II, III, / 2 / FG / T4 Ta=50 °C - 41533;

Entity / Nonincendive Field Wiring Parameters						
Terminal	**Voc (V)**	**IO, Isc (mA)**	**Po * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
Remote Display J5	7	50	87.5	15.7	13.7	ABCD
Communication (J8)	7	50	87.5	15.7	13.7	ABCD
Remote Key Input (J11)	7	62	109	15.4	9	ABCD
Terminal	**Vt (V)**	**It (mA)**	**Pt * (mW)**	**Ca (µF)**	**La (mH)**	**Group**
Load Cell (J10)	7	400	700	8.3	198	ABCD
Load Cell with alternate excitation option (J10)	14	400	1400	4.6	945.2	CD

Special Condition of Use:

When fitted with an alternate Excitation Output Board P/N 420982-40364, the 355IS is not to be used in a Class I, Division 1, Group A and B or Class I, Zone 0, Group IIC Hazardous (Classified) Location as shown on Control Drawing 41533 sheet 2.

2.2.3 Factory Mutual Approval (Weighing Elements)

These weighing elements have been approved for the following hazardous areas:

Model 4542 Summing Box
Intrinsically Safe for Class I, Division 1, Group A-D Intrinsically Safe for Class I, Zone 0, AEx ia Group IIC Non-ignition capable for Class I, Division 2, Group A-D Non-ignition capable for Class I, Zone 2, Group IIC T4 (Ta=50 °C)

ITA Load Cell
Intrinsically Safe for Class I, II, III, Division 1, Group A-G, T4 - 0090070 Intrinsically Safe for Class I, Zone 1, Group 2ABCD, T6 S Class II,III, Division 2, Group G, T6* Type 4 * 'S' indicates special condition of use:

Floating Beam Load Cell	
194430-B0020	Intrinsically Safe for Class I, II, III, Division 1, Group A-G
194432-B0050	Intrinsically Safe for Class I, Zone 0, AEx ia Group IIC
194434-B0100	Non-ignition capable for Class I, Division 2, Group A-D
194442-B0050	Non-ignition capable for Class I, Zone 2, Group IIC
194444-B0100	S Class II, Division 2,Group FG*
194446-B0200	T4 (Ta=40 °C)
194448-B0400	
194450-B0200	* 'S' indicates special condition of use:
194452-B0500	
194454-B1000	

2.3 Factory Mutual Approval (ATEX)

FM approval number FM06ATEX0024

Gas	Approval	Temperature Range	T class	Zone
Indicator	II 1 G Ex ia IIC T4	-10 °C to + 50 °C	T4	1 & 2
AC mains PSU	II 2 G Ex mb[ia] IIC T4	-10 °C to + 50 °C		
Indicator	II 1 G Ex ia IIC T4	-10 °C to + 50 °C	T3	0, 1 & 2
Battery pack	II 1 G Ex ia IIC T3	-10 °C to + 40 °C		

Dust	Approval	Temperature Range	Enclosure	Zone
Indicator	II 1 D Ex iaD 20 T117 °C	-10 °C to + 50 °C	IP6X	21 & 22
AC mains PSU	II 2 D Ex mbD 21 T64 °C	-10 °C to + 50 °C		
Indicator	II 1 D Ex iaD 20 T117 °C	-10 °C to + 50 °C	IP6X	20, 21 & 22
Battery pack	II 1 D Ex iaD 20 T193 °C	-10 °C to + 40 °C		

Above FM ratings include the following options:

24H350-100B0: Fiber Optic Transceiver Option Kit

Following component must be used in a safe area. This product does not have FM approval:

24S350-200B0: Battery Charger, M350 I.S. /355 I.S.

2.4 CSA Approval

Master Contract Number: 22640

Certificate Number: 1538366

Ex nL IIC:

Class I, Division 2, Groups A, B, C, D

Weight indicators, Models 350 I.S. and 355 I.S., powered by either battery pack module, Model 3502 or associated apparatus AC-DC power supply, Model 3501, rated 90-250 VAC, 50/60 Hz, 120 mA with single I.S. output rated 12.7 volt, 315 mA. Non-Incendive when installed per Control Drawing 41533. Temp. Code T4 at Tamb = 50 °C.

Ex nL IIC:

Class I, Division 2, Groups C, D

Weight indicators with 8 Volt excitation option board, Models 350 I.S. and 355 I.S., powered by either battery pack module, Model 3502 or associated apparatus AC-DC power supply, Model 3501, rated 90-250 VAC, 50/60 Hz, 120 mA with single I.S. output rated 12.7 volt, 315 mA. Non-Incendive when installed per Control Drawing 41533. Temp. Code T4 at Tamb = 50 °C.

Ex ia IIC:

Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III:

Weight indicators, Models 350 I.S. and 355 I.S., powered by either battery pack module, Model 3502 or associated apparatus AC-DC power supply, Model 3501, rated 90-250 VAC, 50/60 Hz, 120 mA with single I.S. output rated 12.7 volt, 315 mA. Intrinsically Safe when installed per Control Drawing 41533 with the Entity Parameters listed. Temp. Code T4 at Tamb = 50 °C.

Ex ia IIB:

Class I, Groups C, D; Class II, Groups E, F, G; Class III:

Weight indicators with 8 Volt excitation option board, Models 350 I.S. and 355 I.S., powered by either battery pack module, Model 3502 or associated apparatus AC-DC power supply, Model 3501, rated 90-250 VAC, 50/60 Hz, 120 mA with dual single I.S. output rated 12.7 volt, 315 mA. Intrinsically Safe when installed per Control Drawing 41533 with the Entity Parameters listed. Temp. Code T4 at Tamb = 50 °C.

Item	Part Number	Approval		
5 Volt Excitation 350 I.S.	20H350-01010 20H350-01020 20H350-01030 20H350-06010 20H350-06020 20H350-06030	Class I, Div. 2, Groups A, B, C, D	Ex nL IIC	T4 at Tamb = 50 °C
		Class I, Div. 2, Groups A, B, C, D; Class II, Groups E, F, G; Class III	Ex ia IIC	T4 at Tamb = 50 °C
5 Volt Excitation 355 I.S.	20H355-01010 20H355-01020 20H355-01030 20H355-06010 20H355-06020 20H355-06030	Class I, Div. 2, Groups A, B, C, D	Ex nL IIC	T4 at Tamb = 50 °C
		Class I, Div. 2, Groups A, B, C, D; Class II, Groups E, F, G; Class III	Ex ia IIC	T4 at Tamb = 50 °C
8 Volt Excitation 350 I.S.	20H350-01011 20H350-01021 20H350-01031 20H350-06011 20H350-06021 20H350-06031	Class I, Div. 2, Groups C, D	Ex nL IIC	T4 at Tamb = 50 °C
		Class I, Div. 2, Groups C, D; Class II, Groups E, F, G; Class III	Ex ia IIB	T4 at Tamb = 50 °C
8 Volt Excitation 355 I.S.	20H355-01011 20H355-01021 20H355-01031 20H355-06011 20H355-06021 20H355-06031	Class I, Div. 2, Groups C, D	Ex nL IIC	T4 at Tamb = 50 °C
		Class I, Div. 2, Groups C, D; Class II, Groups E, F, G; Class III	Ex ia IIB	T4 at Tamb = 50 °C

2.5 Standard Functions

The Model 350 I.S. and 355 I.S. include built-in functions that you can enable through the Indicator Setup. Refer to chapter 4, *Configuration* for information on the setup and operation of the following standard functions:

- Check-weighing
- Parts counting
- Remote key operation
- Selectable, built-in data transmission formats
- Custom data transmissions

2.6 Standard Features

- Three display choices (LCD, LCD backlit and LED).
- LED model uses low current high efficiency display digits and annunciators to save battery life and adds brightness to dimly lit areas.
- Real time clock with battery backed time and date.
- Two RS-232 communication ports.
- Model 355I.S. has a numeric keypad
- Stainless Steel wash down enclosure
- Up to (4) 350 ohm loadcells
- Easily update firmware via the RS-232 port

2.7 Specifications

Performance

Full Scale (F.S.)	Selectable 0 to 999,999
Resolution	20-bit A/D converter, 100,000d displayed, 1,000,000d internal
A/D Conversion	60 Hz
Zero Track	0 - 100% of Full Scale
Operating Temperature	-10 °C to +40 °C
Units of Measure	lb, kg, oz, g, lb-oz

Electrical

Power RequirementInput (J14):	5.1V - 12V DC
Excitation Voltage	5 VDC or 8V DC
Excitation Current	57 mA max. (5V EXC) or 91mA max. (8V EXC) / (4) 350 Ω bridge
F.S. Signal Input	0.1 mV/V min - 10 mV/V max
Signal Connection	4 lead or 6 lead with sense

Process Control

Remote Input	Two momentary contact closure (100ms minimum) TARE, PRINT, ZERO

Enclosure

Shipping Weight	7 lb (3 kg)
Material	304 Stainless Steel, NEMA 4X/IP66 Design
Mounting	Two swivel brackets are available for battery or AC operation

Display

LED	6-digit weight display, 0.8" (22mm) height 12 LED annunciators for operational status
LCD	6-digit weight display, 1.0" (25.4mm) height 12 LCD annunciators for operational status. Built in LCD status bargraph. Also available with backlight

Communication

RS-232	One RS-232 communication ports with hardware handshaking, (1) RS-232 communication port with Fiber Optic connection

Keypad

350I.S.	Five key, durable elastomeric (rubber)
355I.S.	22 key, full numeric, durable elastomeric (rubber)

Safe Area Options

Battery Charger	Charges completely discharged battery option in 3.5 hours Universal AC input 85-265VAC, 50/60 Hz
Fiber Optic Hub	Model 350, Model 355, Model 350I.S., or Model 355 I.S. installs in the safe area and connects to a Model 350/355 I.S. Allows setpoint and/or analog output options. Communicates with hazardous area indicator via fiber-optic cable.

Hazardous Area Options

Battery	Stainless steel enclosure, mounts to indicator swivel bracket. 200 hours continuous use with LCD display + 1 loadcell, and 100 hours continuous use with LED display + 1 loadcell. Charge time 3.5 hours with battery charger option.
AC to DC Power Supply	Stainless steel enclosure. Powers up to 2 indicators (2 indicators can only be powered in Groups C-G hazardous area). Wall mount. Universal AC input 90-250VAC, 50/60 Hz.
Power Extension Cable	Allows the AC-DC power supply to be mounted away from the indicator. 25 feet and 50 feet lengths available.

2.8 Display

The Model 350 and 355 intrinsically safe indicators are available with a six digit, 7-segment red LED display, six digit, 7-segment black LCD display or 7-segment backlit LCD display. The Model 350 and 355 I.S. will display alphanumeric data, but due to the nature of 7-segment LED / LCD and the limitation of six digits, some information is abbreviated.

All segments and annunciators are illuminated for a brief display test upon power up. The current gross weight is then displayed in default units.

2.8.1 LED Display

The LED display is a six digit, 7-segment bright red LED screen with 12 annunciators to show weight and status information.

The SP1, SP2, and SP3 annunciators are red, green, and yellow.

There is also an annunciator for a third unit of measure under kg. Place the third unit label above the third annunciator (the third unit is available on both the LED and LCD displays). See page 57 for third unit setup.

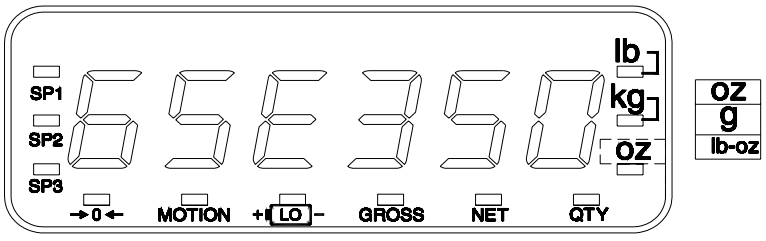


Figure 2.1 LED Display

2.8.2 LCD Display

The LCD display is a six digit,7-segment black LCD screen with 12 annunciators and a bargraph to show the operational status.

There is also an annunciator for a third unit of measure under kg. Place the third unit label above the third annunciator (the third unit is available on both the LED and LCD displays). See page 57 for third unit setup

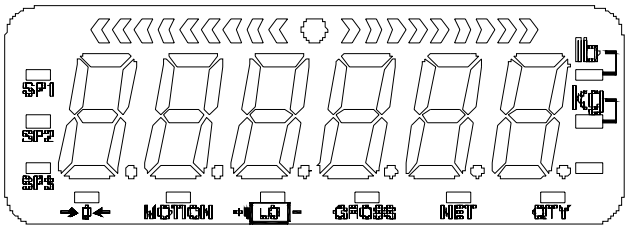


Figure 2.2 LCD Display

2.8.3 Annunciators

Annunciators provide mode and status information. When illuminated, they indicate the following conditions:

Table 2.2 Annunciators

SP1	Setpoint #1 activated (relay 1 closed).
SP2	Setpoint #2 activated (relay 2 closed).
SP3	Setpoint #3 activated (relay 3 closed).
>0<	Displayed weight is at center-of-zero (¼ display graduation).
MOTION	Scale is in motion. Motion inhibited transmits and motion inhibited setpoint activation will be delayed until motion ceases.
LO	Lights when the battery reaches a low tolerance.
GROSS	Displayed value represents the current gross weight.
NET	Displayed value represents the current net weight.
QTY	Displayed value represents the current piece quantity (Count).
lb	The displayed value is represented in pounds.
kg	The displayed value is represented in kilograms.
Oz, lb oz, g	The displayed value is represented in ounces, pound ounces or grams.

2.9 350 I.S. Keypad

The Model 350 I.S. offers a sealed 5-button elastomer keypad is used for operator input. Each key is assigned two distinct functions. Various key combinations are also used. Each key has secondary functions; allowing an operator to enter target values, perform piece samples, access setup parameters, etc.

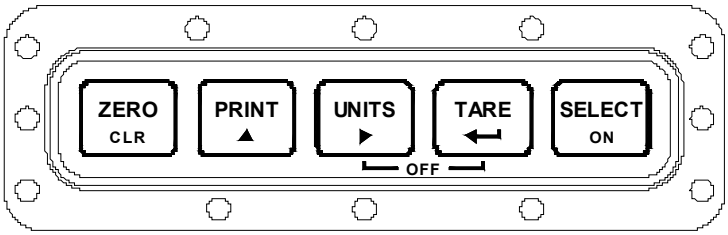


Figure 2.3 350I.S. Keypad

Key Press	Weigh Mode	Count Mode	Setup Mode
ZERO CLR	Performs a gross zero function and/or clears an entry in progress. Hold this key on power-up to turn on the display regardless of P420.	Performs a quantity zero function and/or clears an entry in progress.	Exits the Setup Mode and/or answers "NO" to query prompts and/or clears an entry in progress.
PRINT ▲	Performs a print function and/or 'scrolls' through digits during setpoint entry.	Performs a print function and/or 'scrolls' through digits during setpoint entry.'	Scrolls' through digits during data entry.
UNITS ▶	Toggles between 'lb' and 'kg' and/or advances cursor to next entry position.	Toggles through standard sample sizes and/or begins a new sample entry.	Advances cursor to next entry position and/or cycles prompts.
TARE ↵	Performs an auto-tare function (if enabled) and/or accepts an entry in progress.	Performs an auto-tare function and requests a piece sample and/or accepts an entry in progress.	Accepts an entry in progress and/or 'scrolls' through parameter sub-set selections and/or answers 'YES' to query prompts.
SELECT ON	Toggles between display modes and/or restores power to the indicator (if auto-shutoff enabled).	Toggles between display modes and/or restores power to the indicator (if auto-shutoff enabled).	Advances to the next setup parameter.
ZERO CLR + SELECT ON	Access Local Setup Mode.	Access Local Setup Mode.	No function.
TARE ↵ + SELECT ON	No function.	No function.	Return to the previous setup parameter.

Key Press	Weigh Mode	Count Mode	Setup Mode
ZERO CLR + TARE ↵	Absolute clear - clears an entry in progress and/or clears the value of a parameter.	No function.	Clears any entry in progress.
ZERO CLR + PRINT ▲	Backspace - erases the right-most digit during data entry.	Backspace - erases the right-most digit during sample entry.	Backspace - erases right-most digit during data entry
UNITS ▶ + TARE ↵	Turn off indicator by holding key for approximately 1 second.T	Turn off indicator by holding key for approximately 1 second.	Turn off indicator by holding key for approximately 1 second.
PRINT ▲ + SELECT ON	Extended gross.	Extended gross.	No function.
PRINT ▲ + UNITS ▶	Reverse character scroll during data entry.	Reverse character scroll during sample entry.	Reverse character scroll during data entry.

2.10 355 I.S. Keypad

The Model 355 I.S. keypad performs different functions in the Weigh Mode, the Setup Mode, and the Calibration Mode. The number keys make entering a tare value or average piece weight easier.

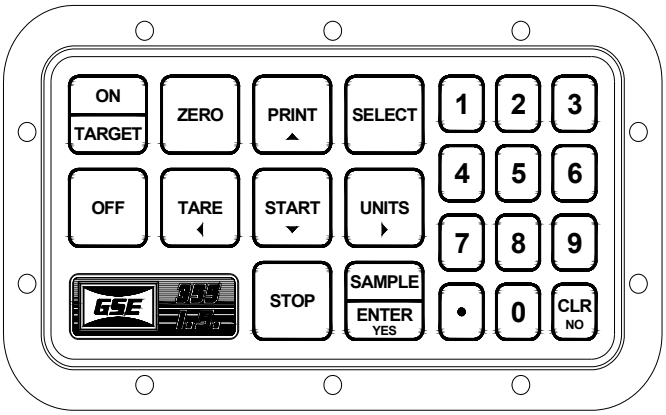


Figure 2.4 355I.S. Keypad

Key Press	Weigh Mode	Count Mode	Setup Mode
ZERO	Performs a gross zero function and/or clears an entry in progress. Hold this key on power-up to turn on the display regardless of P420.	Performs a quantity zero function and/or clears an entry in progress.	Exits the Setup Mode and/or answers "NO" to query prompts and/or clears an entry in progress.
PRINT	Performs a print function and/or 'scrolls' through digits during setpoint entry.	Performs a print function and/or 'scrolls' through digits during setpoint entry.'	Scrolls' through digits during data entry.
UNITS ▶	Toggles between 'lb' and 'kg' and/or advances cursor to next entry position.	Toggles through standard sample sizes and/or begins a new sample entry.	Advances cursor to next entry position and/or cycles prompts.
TARE ◀	Performs an auto-tare function (if enabled) and/or accepts an entry in progress.	Performs an auto-tare function and requests a piece sample and/or accepts an entry in progress.	Accepts an entry in progress and/or 'scrolls' through parameter sub-set selections and/or answers 'YES' to query prompts.
SELECT	Toggles between display modes and/or restores power to the indicator (if auto-shutoff enabled).	Toggles between display modes and/or restores power to the indicator (if auto-shutoff enabled).	Advances to the next setup parameter.
SAMPLE / ENTER	Performs a sample. If a number is keyed in before hand, it will be used as the sample size. Accepts an entry.	Performs a sample. If a number is keyed in before hand, it will be used as the sample size.	Accepts an entry.
CLR NO	Clears an entry in progress. Hold this key on power-up to turn on the display regardless of P420.	Performs a quantity zero function and/or clears an entry in progress.	Exits the Setup Mode and/or answers "NO" to query prompts and/or clears an entry in progress.

Key Press	Weigh Mode	Count Mode	Setup Mode
START ▼	If setpoints are enabled, causes a process to start or resume. See parameter 5003 on page 63 for details on enabling the START function.	If setpoints are enabled, causes a process to start or resume. See parameter 5003 on page 63 for details on enabling the START function	No function
STOP	If setpoints are enabled, causes a pause. Press [STOP] again to abort the process. See parameter 5002 on page 63 for details on enabling the STOP function.	If setpoints are enabled, causes a pause. Press [STOP] again to abort the process. See parameter 5002 on page 63 for details on enabling the STOP function.	No function
ON / TARGET	Wake up the indicator if in sleep mode. Turn on the indicator if power is off. Access the target entry mode. See parameter 5000 on page 63 for details on enabling the TARGET function.	Wake up the indicator if in sleep mode. Turn on the indicator if power is off. Access the target entry mode. See parameter 5000 on page 63 for details on enabling the TARGET function.	No function
OFF	Turn off indicator by holding key for approximately 1 second.	Turn off indicator by holding key for approximately 1 second.T	Turn off indicator by holding key for approximately 1 second.
ZERO CLR + SELECT ON	Access Local Setup Mode.	Access Local Setup Mode.	No function

*When the 355 I.S. keypad is installed with a new main board, the 355 I.S. keypad must be initialized. Hold down the **[ENTER]** key while power is applied. If the keypad was enabled, the display will show "EntHld". To reestablish the keypad as a 350 I.S., hold down the **[TARE]** key of the 350 I.S. keypad while power is applied by pressing the **[SELECT]** key.*

2.11 Weigh Mode Functions

The Model 350 I.S. and Model 355 I.S. keypads have five primary Weigh Mode functions:

ZERO	Performs a gross zero and selects the gross mode.
PRINT	Initiates data transmission out the selected communication port.
UNITS ▶	Toggles the units of measure between lb, kg, g, lb oz, oz.
TARE ◀	Tares any displayed weight and selects the net mode.
SELECT	Toggles the display between GROSS, NET, QUANTITY and setpoint TARGETS (if enabled).

2.12 Entering a Tare Value (Model 350 I.S.)

If a tare value is known, it is possible to enter that value into the tare register. Follow the steps below.

1. From the tare mode use the [PRINT] key to scroll in the first number.
2. Press the [UNITS] key to move to the next digit.
3. Repeat steps 1 and 2 until the desired number is showing on the display.
4. Press the [TARE] key to accept the entered tare value.

2.13 Entering a Tare Value (Model 355 I.S.)

If a tare value is known, it is possible to enter that value into the tare register. Follow the step below.

1. Key in the known tare value with the numeric keys and press [TARE]. The display will access the net mode.

3 Installation

The Model 350/355 I.S. stainless steel enclosure meets NEMA 4X type specifications.

The encapsulant used is Dow Corning "Sylgard 170" Silicone Elastomer.

Do not allow the power supply or battery pack to be immersed in hazardous liquid, or to be subjected to any condensation of the hazardous atmosphere.

If the power supply or battery pack is likely to be splashed with hazardous liquid, protect it with a splash guard.

Never mount the power supply or battery pack in a position where it is permanently subjected to hazardous atmosphere, such as in a pit, or any closed, unventilated space. Always mount the unit in a position which minimizes its' exposure to the hazardous gas, vapor, or dust.

The heating effect of the sun must be taken into account when installing hazardous area equipment, especially in hot climates. If exposed to direct sunlight, it is possible that the temperature class (T4 = 135 ºC, T3 = 200 ºC) may be exceeded.

Contact Avery Weigh-Tronix for further information with regard to hazard analysis, and compatibility of equipment with hazardous materials.

3.1 Control Drawings

Control drawings provide details of the allowed interconnections between the Model 350 I.S. and Model 355 I.S. indicators, their options, and other possible devices. The drawing also shows the entity ratings of the indicators to allow easy selection of other devices approved under the entity concept. See , *Appendix A: Model 350 I.S. and Model 355 I.S. Control Drawings* for further details.

3.2 Outline Drawings

The outline drawings provide measurements needed for indicator installation.

3.2.1 Model 350 I.S.

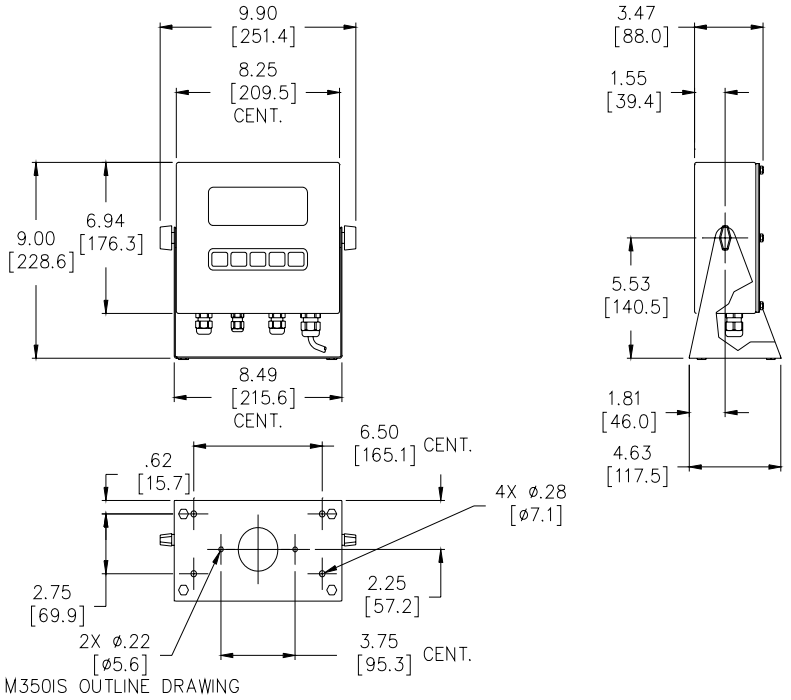


Figure 3.1 Model 350 I.S. with Standard Swivel Bracket

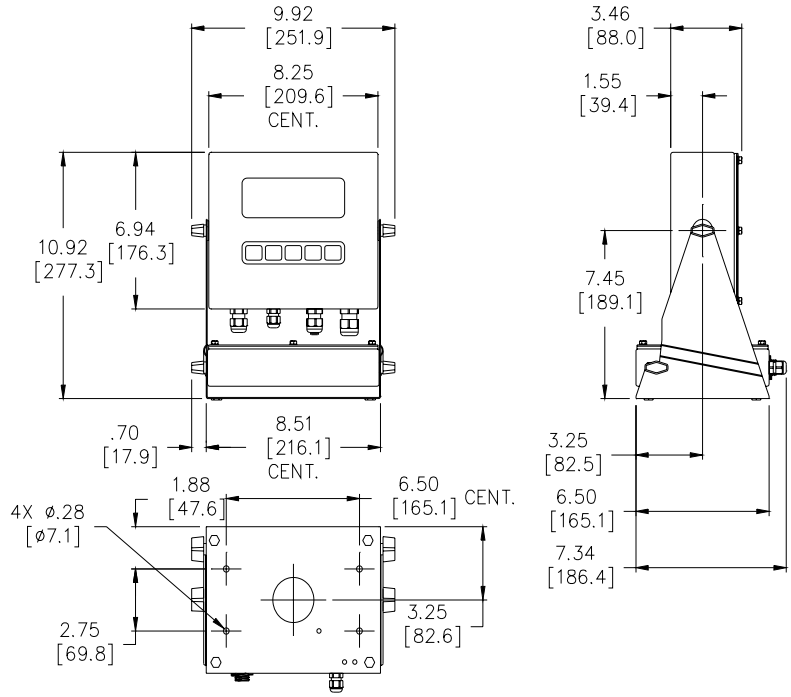


Figure 3.2 Model 350 I.S. with Battery Swivel Bracket

3.2.2 Model 355 I.S.

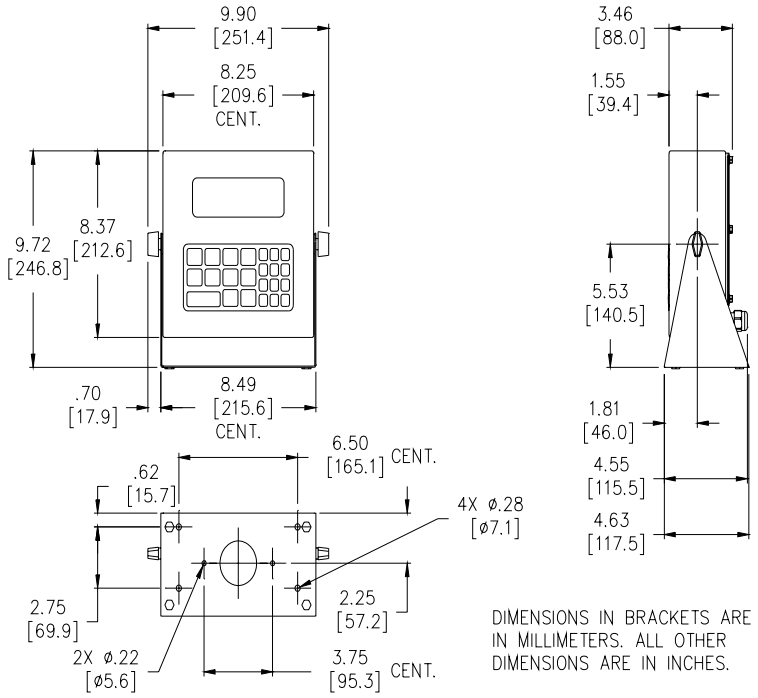


Figure 3.3 Model 355 I.S. with Standard Swivel Bracket

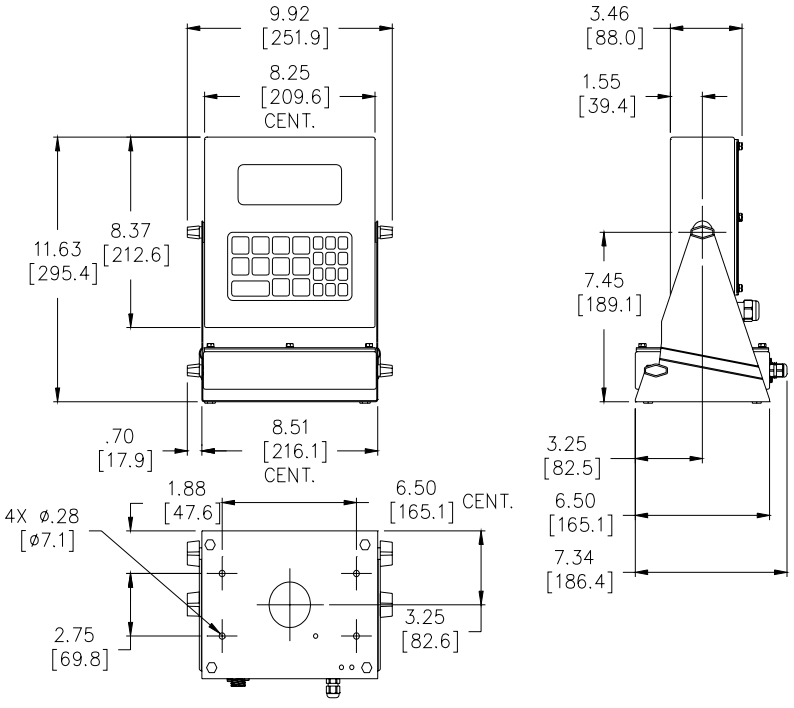


Figure 3.4 Model 355 I.S. with Battery Swivel Bracket

3.3 Load Cell Connections

A high quality braided shield cable with 16 to 24 AWG stranded wire is recommended for load cell or summing box connections. Route the load cell cable through the strain relief supplied on the bottom (350 I.S.) or back (355 I.S.) of the enclosure. Either four or six conductor cables can be used.

Do not tin the ends of the load cell wire! A terminal connection free from the effects of vibration and oxidation can be assured only if the load cell terminals securely grip a bare, stranded wire.

When using four conductor cables move the sense jumpers to the internal position. When using six conductor cables move the sense jumpers to the external position. Utilizing the (+) and (-) Sense leads of six conductor cables provides compensation for variations in the excitation voltage due to resistance changes in the cable. See Figure 3.5 for the load cell connector.

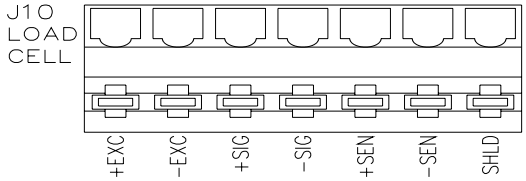


Figure 3.5 Main-board Load Cell Connector (J10)

3.4 Communication Port Connections

The 350 I.S. and 355 I.S. come standard with two RS-232 communication ports. Every device connected to a communication port of the Model 350/355 I.S. must be approved for the appropriate hazardous area and entity parameters.

Only communication port 1 has hardware handshaking (CTS and RTS). Refer to the diagram below for connections to each communication port.

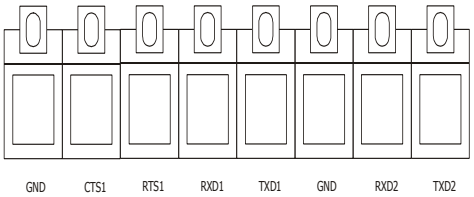


Figure 3.6 Main-board Communication Port Connector (J8)

3.5 Remote Key Connections

The Model 350 I.S. and Model 355 I.S. accommodate two remote keys connections. A remote switch may be connected to J11 on the main board to provide remote activation of print, tare, or zero functions. The remote switch being connected must be approved for the appropriate hazardous area and entity parameters.

The connection for the remote switch input for remote key1 is between key 1 and GND. Connect a second remote switch to key 2 and GND. Refer to Figure 3.7 for an illustration of switch connections.

A two-conductor shielded cable between 28 and 20 AWG is recommended. The input requires a contact closure from a push-button switch, a 'dry' relay contact, a photo-eye, and a proximity sensor or other such device. A closure initiates the operation specified at P800. A closed switch will conduct 2.2 mA.

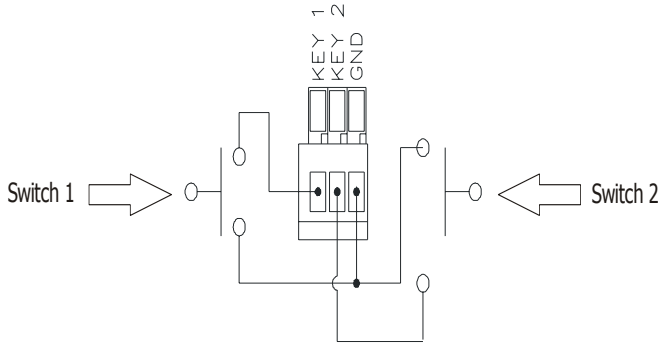


Figure 3.7 Remote Key Connection

Do not apply an external voltage to remote key terminals! Only a contact closure is required to activate the remote key input.

The open circuit voltage across the remote key pins is +5 VDC. A closed switch will conduct about 0.25 mA. Therefore, a low-voltage switch with gold-plated contacts is recommended. A Mercury-wetted switch will also work well. Minimum contact duration of 100 ms is required. Once invoked, the selected remote key operation will not repeat until the contact is released and closed again. See page 75 for Remote Key Configuration.

3.6 Remote Display Connections

It is possible to connect one Model 350/355 I.S. indicator to another Model 350/355 I.S. and have the remote indicator display a copy of the master indicator or customize the display of the remote (slave) indicator. The remote (slave) indicator's keypad will operate the master indicator. Refer to Figure 3.8 to connect the master indicator to the remote (slave) indicator.

Refer to page 107 to configure the master and remote (slave) displays. There are several different configurations for Master to remote (slave) indicator connection and setup. Since there are two communication ports on both the master and slave units, it is possible to connect a printer or computer.

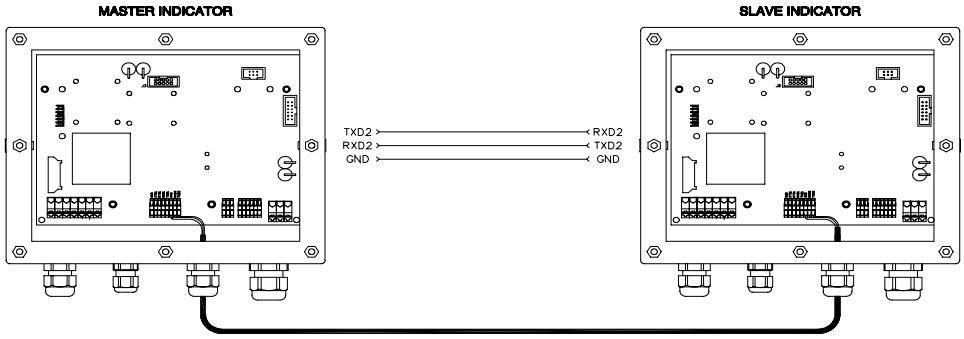


Figure 3.8 Master Indicator to Remote (Slave) Indicator Connections

3.7 Hazardous Area Options

These options have been Factory Mutual approved to operate in a hazardous area.

DO NOT INSTALL THE SETPOINT OPTION OR ANALOG OUTPUT OPTION INSIDE OF THE MODEL 350/355 I.S. ENCLOSURE LOCATED IN THE HAZARDOUS AREA. INSTALL THESE OPTIONS IN THE SAFE AREA INDICATOR. REFER TO PAGE 42 FOR INSTALLATION INSTRUCTIONS.

3.7.1 Battery Power Supply (External)

Part number 24H350-3502A

The battery is enclosed in a stainless steel case and cannot be removed from the case. The battery module is mounted on the indicator swivel bracket. The battery will operate approximately 200 continuous hours with LCD display (backlight off, 1 load cell and no options installed) or 100 hours with the LED display (one load cell and no options installed). ***Please do not throw away old battery packs. Recycle or return to place of purchase for recycling.***

Mount the battery module in the swivel bracket:

1. Hold the battery module in both hands. Make sure the connectors on the battery module are facing the back of the indicator.
2. Line up the two protrusions on each side of the battery module with the slide rails on the swivel bracket.
3. Push the module into the slide rails until the knobs drop into the slots in the swivel bracket.
4. Tighten the knobs to hold the battery module in the swivel bracket.

Battery Charging

THE BATTERY MUST BE CHARGED IN THE SAFE AREA

Connect the battery to the Avery Weigh-Tronix battery charger. Connect the battery charger to AC power. Charging will take approximately 3.5 hours.

Low Battery Indication

The low battery annunciator will be lit when the voltage reaches a low threshold and the low battery message (Lo Bat) is shown on the display for 1.5 seconds every 15 seconds.

Flat (discharged) Battery Shutdown

The indicator will shutdown after five minutes of flat (discharged) battery condition.

3.7.2 AC To DC Power Supply (External)

Part number 24H350-3501A

NOTE: For ATEX When one power supply is used to power two indicators then the combination cannot be used in a Zone 1 or a IIC gas group hazard.

For ATEX ensure AC cable is protected in conduit which is sealed with appropriate ATEX approved conduit seal device.

For ATEX the AC supply must be protected by a 4000A breaking capacity fuse of the appropriate current rating, i.e. 3A

The AC- DC power supply is in a stainless steel enclosure which is remotely mounted. The power supply is capable of powering up to (2) Model 350/355 I.S. indicators in gas Groups F & G and (1) Model 350/355 I.S. indicator in gas Groups A-G or IIC. Refer to Figure 3.9 for mounting dimensions.

The AC to DC supply has a conduit fitting on the bottom where the power cable is attached to the unit. This fitting is 1" in diameter and has a 1/2" thread.

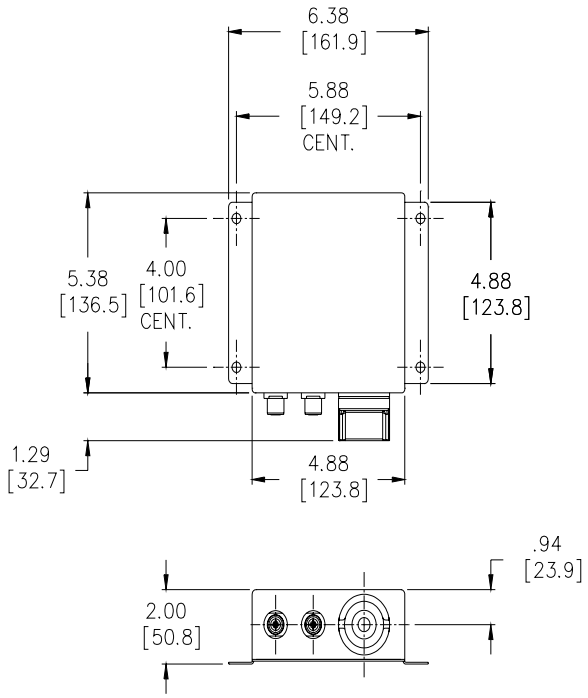


Figure 3.9 AC to DC Power Supply Outline Drawing

3.7.3 AC To DC Power Supply Extension Cable

The extension cable comes in either 25' or 50' length. This cable is used for mounting the AC to DC converter away from the indicator. Fifty feet is the maximum allowed from power supply to indicator.

3.7.4 5 Volt And 8 Volt Excitation

Two versions of excitation are available for the Model 350 I.S. and Model 355 I.S. The 5-volt excitation consumes less power than the 8-volt excitation module. The 5-volt excitation is standard on the main board. The 8-volt excitation is on a separate board which is installed by the factory. The 5-volt excitation is +5V to 0V. The 8-volt excitation is +5V to -3V.

3.7.5 Fiber-Optic Interface

It is possible to use setpoints and analog output by interfacing the hazardous area indicator (350 I.S. or 355 I.S.) with any 350 Series stainless steel indicator in the safe area. A fiber-optic option kit (24350B-420B0) will be used for both indicators and installed in the control and hub indicators. Refer to the installation instructions below.

Fiber-Optic Board Installation

1. Remove the rear panel screws of the Model 350/355 I.S.
2. Locate the fiber-optic board connector (J6) on the Model 350/355 I.S. main board.

3. Snap the (4) ½ plastic standoffs provided with the fiber-optic board into the holes surrounding the J6 connector. This area is outlined.

4. Place the fiber-optic board on the standoffs but do not press onto the standoffs.

5. Line up the J1 connector on the back of the fiber-optic board with J6 on the Model 350/355 I.S. main board.

6. Press the fiber-optic board onto the plastic standoffs. Refer to Figure 3.10.

7. Remove the rubber plugs from the J2 and J3 connectors on the fiber optic board.

8. Follow the instructions on page 38 for installing the fiber-optic cable to the fiber-optic board.

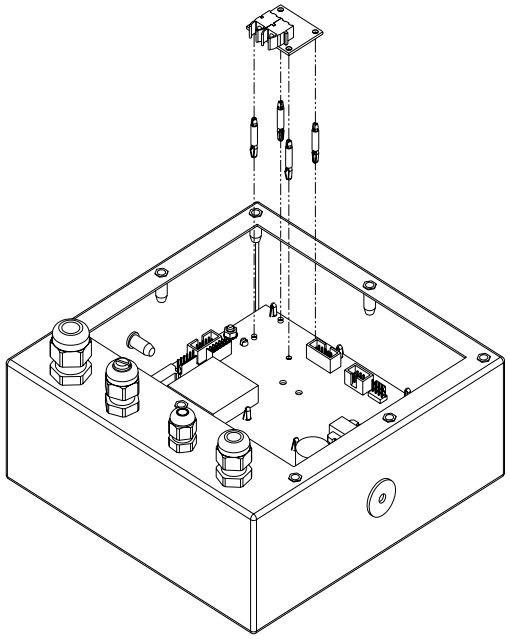


Figure 3.10 Fiber-optic Board Installation (Model 350 I.S. / 355 I.S.)

3.8 Safe Area Options

3.8.1 Fiber-Optic Interface

For detailed instructions on installing the fiber-optic interface option refer to page 38

Plastic Fiber-Optic Cable Installation and Termination

The plastic fiber-optic cable is an inexpensive way to connect an intrinsically safe indicator to a safe area hub indicator. The cable allows a distance of 200 feet maximum.

1. Unscrew cap from the strain relief next to the loadcell strain relief.

2. Remove rubber grommet from inside the strain relief

3. Insert the two-hole seal which was included with fiber-optic board kit. Install the small end of the seal first.

4. Reinstall the strain relief cap on the strain relief, but do not tighten. Refer to Figure 3.11.

5. Pull apart conductors of plastic fiber cable approximately 1'.

6. Insert plastic fiber conductors through seal holes in the strain relief.

7. Terminate plastic fiber conductors by using snap-on connectors (part# 26-20-4531) and polishing kit (part# 31-80-0225) according to termination instructions (part# 39-10-42119).

8. Plug fiber connectors into connectors on fiber-optic board. Make sure that RX goes to TX and TX goes to RX.

9. Tighten stain relief cap.

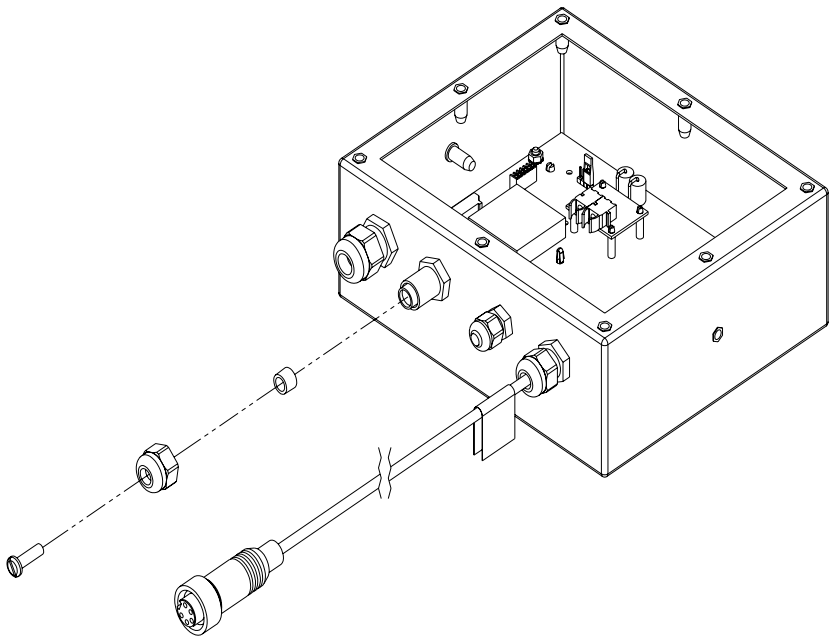


Figure 3.11 Fiber-optic Cable Installation and Termination

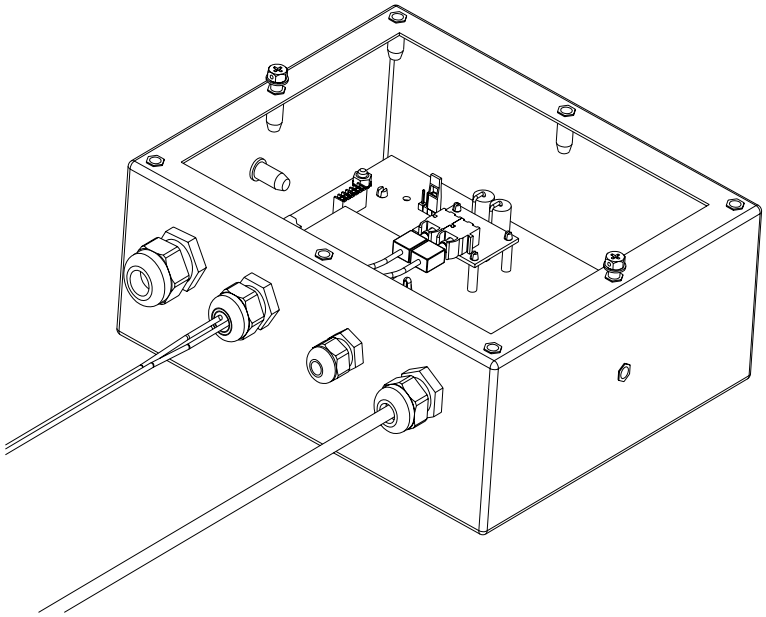


Figure 3.12 Fiber-optic Cable Installation (Plastic Cable)

3.8.2 HCS (Hard Clad Silica) Fiber-Optic Cable Installation

The HCS cable is glass fiber in a round jacket. The cable allows a distance of 1000 feet maximum. Since HCS fiber-optic cable is not easily fabricated on site and tooling is too expensive for on time use. Prefabricated cables in 100 feet increments can be purchased from Avery Weigh-Tronix. The cable comes ready to install with connecting ends and a strain relief for the enclosure.

1. Remove the strain relief to the right of the load cell strain relief.
2. Insert the strain relief of the HCS cable through the strain relief hole of the enclosure.
3. Slide the strain relief nut over the HCS cable and screw it to the strain relief. Tighten nut with a 7/8" socket or wrench.
4. Plug fiber connectors into connectors on fiber-optic board.
5. Tighten stain relief cap.

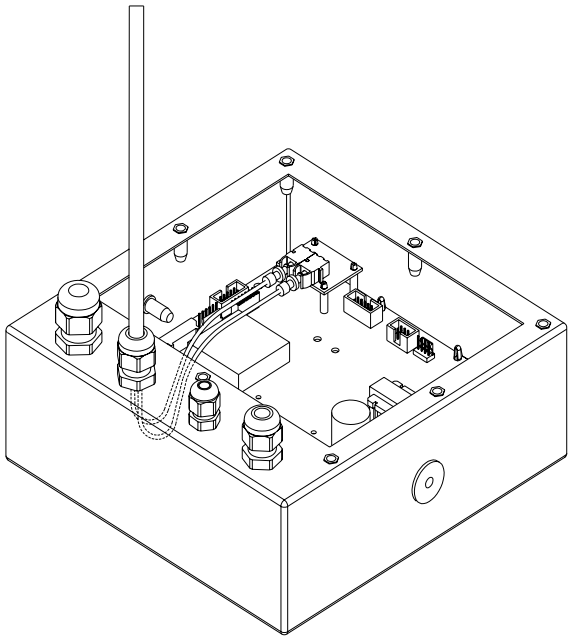


Figure 3.13 Fiber-optic Cable Installation (HCS Cable)

3.8.3 Safe Area Setpoint Option Installation

Using one of the software setpoint configurations (see Setpoint Setup on page 77) in conjunction with the setpoint option board gives the Safe Area indicator the ability to directly control external devices such as valves, relays, actuators, etc.

There are up to three setpoint outputs available. The activation and deactivation is controlled by the setpoint configuration. The outputs are capable of driving up to one Amp at 20-280VAC & 2 Amp at 3-60VDC. The solid state relays are normally open (N.O.) contacts.

See Setpoint Setup on page 77 for setpoint software configuration details.

The Safe Area Hub contains components which could be damaged by Electrostatic Discharge (ESD) if serviced improperly. Use proper ESD precautions (wear a wrist strap connected to ground, use grounded work stations, etc.) when opening the enclosure.

Never connect or disconnect option board cables while the indicator is powered. Doing so may result in circuit board damage.

Install the setpoint or Analog option in a safe area hub

1. Open the indicator.
2. Remove the eight screws from the back of the unit.
3. Locate the three studs and one thru-hole on the main board that the option mounting bracket will be attached to. See Figure 3.14. Remove the nuts from the three studs on the main board.

3a. It may help to position the option mounting bracket over the main board to locate the three studs and one thru-hole.

4. Install the nylon stand-off supplied with the option bracket kit into the thru-hole on the option bracket. See Figure 3.14.

4a. The thru-hole on the option bracket is the irregular flanged section (a smaller hole than the others on the bracket).

5. Install the three hex stand-offs onto the studs on the main board.
6. Tighten the stand-offs gently with a 6 mm hex nut driver.

6a. If this is the first option card, attach the loose end of the cable to the serial I/O connector (J3) on the main board. Let the card gently hang over to the outside of the enclosure until mounting. J3 is a 10-pin polarized connector.

6b. This step is not necessary if this is the second card installed.

7. Position the nylon stand-off (attached to the bracket) into the hole on the main board while routing the threads of the other hex stand-offs through the holes on the bracket, while pressing down over the nylon stand-off until it snaps into place.
8. Line-up the three other hex stand-offs into the bracket thru-holes first before securing the nylon stand-off into the main board thru-hole.
9. Secure the bracket into position with the hex nuts supplied with the kit. Do not over tighten.
10. Place one set (four pieces) of the nylon sleeve type stand-offs onto the four studs of the option bracket. Place the Setpoint Control Module, component side up, onto the nylon sleeve stand-offs. Install four hex nuts and secure gently.
11. Select the four studs closest to the (J3) connector of the main board to add the four sleeve stand-offs. Be sure the cable is already attached to (J3) on the main board before installing the card. Also be sure the cable is attached to the right-most connector (J3) (as viewed from the component side of the option board). The second connector (J1) is for 'daisy-chaining' another option card. The additional mounting hardware is supplied with the option bracket kit. This hardware should be saved for future use if not being used.
12. Route the analog cable through the available strain-relief. Make sure to connect cable conductors to the proper terminals before closing the unit.
13. Reinstall the back cover. Tighten the eight screws securely to create a good seal. Be sure to avoid pinching the cable between the housing halves.

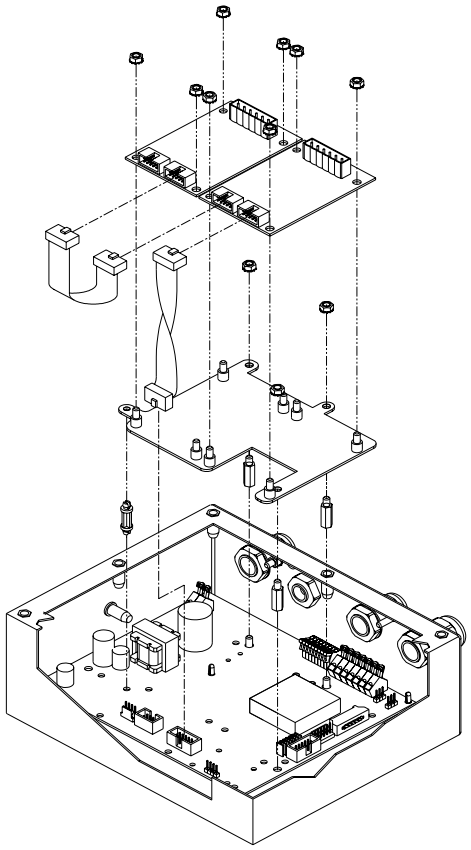


Figure 3.14 Setpoint and Analog Option Installation

3.8.4 Setpoint Board Diagnostic and Test Procedures

This test procedure affects the setpoint output. Be sure to disconnect all peripheral devices attached to the setpoint option card.

To test the setpoint option card:

1. Enter the Setup Mode (see Setup Mode on page 47).
2. Key in [6] [2] [0] [0] [1] [SELECT].
3. Attach the load and power source in series with Setpoint 1 contacts.
4. Press [ENTER] to activate only output #1.
5. Attach the load and power source in series with Setpoint 2 contacts.
6. Press [ENTER] to activate only output #2.
7. Attach the load and power source in series with Setpoint 3 contacts.
8. Press [ENTER] to activate only output #3.

3.8.5 Safe Area Analog Option Installation

The 16-bit electrically-isolated analog output module provides a highly accurate analog signal, proportional to weight in the safe area. This signal can be used for interfacing to PLCs, chart recorders, and other such devices.

See Analog Output Setup on page 101 for analog output software configuration details.

The Safe Area Hub contains components which could be damaged by Electrostatic Discharge (ESD) if serviced improperly. Use proper ESD precautions (wear a wrist strap connected to ground, use grounded work stations, etc.) when opening the enclosure.

Never connect or disconnect option board cables while the indicator is powered. Doing so may result in circuit board damage.

3.8.6 Analog Board Diagnostic and Test Procedures

1. Enter the Setup Mode (see Setup Mode on page 47).
2. Attach the voltmeter + (red) lead to pin 3 (0-10VDC) and the - (black) lead to pin 2 (ISOLATED GND) of the Analog Output connector.
3. Key in [6] [2] [0] [0] [2] [SELECT].
4. Press [ENTER] to set the output to 0%.
5. Press [ENTER] to increase the output to 25%.
6. Press [ENTER] to increase the output to 50%.
7. Press [ENTER] to increase the output to 75%.
8. Press [ENTER] to increase the output to 100%.

To test the 0-20mA output mode:

Voltmeter readings are based on the use of a 500 ohm precision resistor.

Caution! Do not exceed 500 ohms.

1. Enter the Setup Mode (see Setup Mode on page 47).
2. Attach the precision resistor to pin 5 and pin 6.
3. Attach the voltmeter + (red) lead to pin 6 (0-20 mA) of the analog output connector.

4. Attach the voltmeter - (black) lead to pin 5 (ISOLATED GND) of the Analog Output connector.
5. Key in [6] [2] [0] [0] [3] [SELECT].
6. Press [ENTER] to set the output to 0%.
7. Press [ENTER] to increase the output to 25%.
8. Press [ENTER] to increase the output to 50%.
9. Press [ENTER] to increase the output to 75%.
10. Press [ENTER] to increase the output to 100%.

To test the 4-20mA output mode:

Voltmeter readings are based on the use of a 500 ohm precision resistor.

Caution! Do not exceed 500 ohms.

1. Enter the Setup Mode (see Setup Mode on page 47).
2. Attach the precision resistor to pin 5 and pin 6.
3. Attach the voltmeter + (red) lead to pin 6 (4-20 mA) of the analog output connector.
4. Attach the voltmeter - (black) lead to pin 5 (ISOLATED GND) of the Analog Output connector.
5. Key in [6] [2] [0] [0] [4] [SELECT].
6. Press [ENTER] to set the output to 0%.
7. Press [ENTER] to increase the output to 25%.
8. Press [ENTER] to increase the output to 50%.
9. Press [ENTER] to increase the output to 75%.
10. Press [ENTER] to increase the output to 100%.

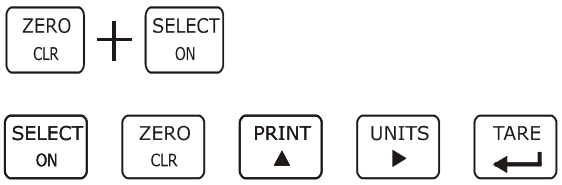
4 Configuration

This section covers in detail how to enter the setup mode, make changes within the setup mode, how to save changes and return back to the weigh mode.

4.1 Entering the Setup Mode

4.1.1 Model 350 I.S.

To prevent accidental changes to the indicator setup, a sequence of keystrokes are used to gain access to the Setup Mode. If the indicator is set for remote display, refer to page 107 for instructions on accessing the setup mode.



These keystrokes must be made within five seconds, or the indicator will return to the Weigh Mode.

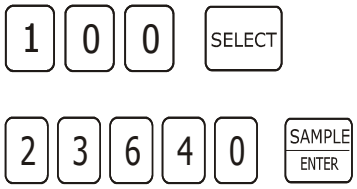
1. From the Weigh Mode, press [ZERO] + [SELECT] simultaneously.
2. Press [SELECT]
3. Press [ZERO]
4. Press [PRINT]
5. Press [UNITS]
6. Press [TARE]

To access Setup in a view-only mode:

1. From the Weigh Mode, press [ZERO] + [SELECT] simultaneously.
2. Press [TARE]

4.1.2 Model 355 I.S.

To prevent accidental changes to the indicator setup, a sequence of keystrokes are used to gain access to the Setup Mode. If the indicator is set for remote display, refer to page 107 for instructions on accessing the setup mode.



These keystrokes must be made within five seconds, or the indicator will return to the Weigh Mode.

To access the Setup Mode:

1. From the Weigh Mode, key in [1] [0] [0] [SELECT]
2. Key in [2] [3] [6] [4] [0] [ENTER]

To access Setup in a view-only mode:

1. From the Weigh Mode, key in [1] [0] [0] [SELECT]
2. Press [ENTER]

4.2 Selecting a Parameter

4.2.1 Model 350 I.S.

To advance to the next parameter

1. Once in the setup mode, press [SELECT]
2. Continue pressing [SELECT] to advance through the parameter map.

To access a specific parameter

1. Press [PRINT] to select the first digit.
2. Press [UNITS] to advance to the next digit.
3. Press [PRINT] to select the next digit.
4. Press [UNITS] to advance to the next digit.
5. Press [PRINT] to select the next digit.
6. Press [SELECT] to advance to the parameter.

To access the previous parameter

1. Press [PRINT]
2. Press [SELECT]
3. Repeat [PRINT] + [SELECT] to back up one parameter.

When accessing a parameter, the parameter number appears briefly. The display then toggles between the parameter name and selection. Pressing [UNITS] will again briefly display the parameter number.

4.2.2 Model 355 I.S.

To advance to the next parameter

1. Press [SELECT]
2. Continue pressing [SELECT] to advance through the parameter map.

To access a specific parameter (for example P200)

1. Key in [2] [0] [0] [SELECT]

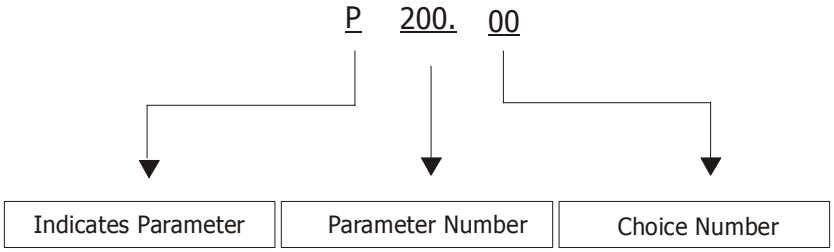
To access the previous parameter

1. Press [.]
2. Press [SELECT]
3. Repeat [.] [SELECT] to back up one parameter.

4.3 Changing a Parameter Value

4.3.1 Selection Parameters

Selection parameters have a pre-defined list of choices to pick from. Each choice is numbered and corresponds to a certain value. The choice number is shown to the right of the decimal point within the parameter number. Repeatedly pressing [TARE] (Model 350 I.S.) or [ENTER] (Model 355 I.S.) while viewing a selection parameter cycles through the available choices, or you can key in the choice number.



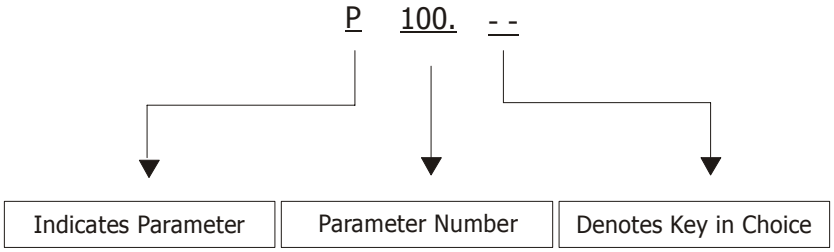
For example, parameter 200 is a selection parameter that holds the baud rate for the serial. This is a selection parameter because a choice number between 00 and 06 must be used. Each choice number corresponds to a different baud rate. To change the baud rate from the default value of 9600 to 4800, perform the following steps from the Setup Mode.

To change the baud rate from the default value of 9600 to 4800:

1. Access parameter 200 (P200). Refer to Selecting a Parameter on page 48 on how to access a specific parameter.
2. Press [TARE] (Model 350 I.S.) or [ENTER] (Model 355 I.S.) until 4800 is displayed.

4.3.2 Key-In Parameters

Key-In Parameters are not limited to a list of choices, although there may be upper and lower value limits. A Key-In Parameter requires that a numeric value be entered using the front panel keys. Key-In Parameters are shown with two hyphens after a decimal point within the parameter number.



4.3.3 Model 350 I.S.

To enter a Key-In Parameter

1. Press [PRINT]. A decimal point is used to represent the entry position.
2. Press [PRINT] until the desired character appears.
3. Press [UNITS]. Another decimal point indicates the next entry position.
4. Repeat steps 2 and 3 until your desired entry value is shown.
5. Press [TARE] to enter your numerical value.

To setup a full scale value (example: 250 lbs)

1. Access the setup mode.
2. Press [PRINT] four times to select the first digit.
3. Press [UNITS] to advance to the next digit.
4. Press [PRINT] six times to select the next digit.
5. Press [UNITS] to advance to the next digit.
6. Press [PRINT] once to select the next digit.
7. Press [TARE] to enter the value.

4.3.4 Model 355 I.S.

To enter a Key-In Parameter

1. Key in the number by using the numeric keys.
2. Press [SELECT] to accept the entry.

To setup a full scale value (example: 250 lbs)

1. Access the setup mode.
2. Key in [2] [5] [0] [ENTER] to accept the entry.

4.4 Exiting the Setup Mode

Any parameters that were changed must be saved before that change will take effect.

4.4.1 Model 350 I.S.

To exit the Setup Mode and save changes

1. Press [ZERO] to begin exiting Setup Mode.
2. Press [ZERO] to bypass Calibration Mode.
3. Press [TARE] to save setup changes.
4. Press [TARE] to complete exit.

To exit the Setup Mode from the view-only mode

1. Press [ZERO] to begin exiting Setup Mode.
2. Press [TARE] to complete exit.

To exit the Setup Mode without saving changes

1. Press [ZERO] to begin exiting Setup Mode.

2. Press [ZERO] to bypass Calibration Mode.
3. Press [ZERO] to exit without saving changes.
4. Press [TARE] to undo changes.
5. Press [TARE] to complete exit.

4.4.2 Model 355 I.S.

To exit the Setup Mode and save changes

1. Press [ZERO] to begin exiting Setup Mode.
2. Press [CLR] to bypass Calibration Mode.
3. Press [ENTER] to save setup changes.
4. Press [ENTER] to complete exit.

To exit the Setup Mode from the view-only mode

1. Press [ZERO] to begin exiting Setup Mode.
2. Press [ENTER] to complete exit.

To exit the Setup Mode without saving changes

1. Press [ZERO] to begin exiting Setup Mode.
2. Press [CLR] to bypass Calibration Mode.
3. Press [CLR] to exit without saving changes.
4. Press [ENTER] to undo changes.
5. Press [ENTER] to complete exit.

4.5 Factory Default

Parameter 65001 and 65002 are available to return the Model 350/355 I.S. to factory settings. Parameter 65001 will reset parameters including the calibration, while parameter 65002 resets all parameters except the calibration.

4.5.1 Return to factory default (350 I.S.):

Access the setup mode. See page 47 for details.

1. Key in [6] [5] [0] [0] [1] or [6] [5] [0] [0] [2] [SELECT]
2. Press [TARE] once.
3. Press [TARE] once.
4. Press [ZERO] [ZERO] [TARE] [TARE]

4.5.2 Return to factory default (355 I.S.):

Access the setup mode. See page 47 for details.

1. Key in [6] [5] [0] [0] [1] or [6] [5] [0] [0] [2] [SELECT]
2. Press [ENTER] once.
3. Press [ENTER] once.
4. Press [ZERO] [CLR] [ENTER] [ENTER]

4.6 List of Parameters

The Model 350 I.S. and Model 355 I.S. have several parameters that can be configured to your specific application. Below is a table of the available parameters. Also refer to page 56 for explanations of each parameter.

Parameter Number	Display Name	Default Value	Valid Range/ Choices	Parameter Description	Page
P110.--	F.S.=	100.00	.01 - 999,999 (Keyed In)	Full Scale	56
P111.09	1Grad	.01	.00001 - 500 (24 Selections)	Count By	56
P112.05	Ztrac	0.5d	Off - 20.0d (200 Selections)	Zero Track Aperture	56
P114.10	Stabl	1.0d	Off - 20.0d (200 Selections)	Stability Window	56
P115.10	StDly	1 Sec	0.05 - 10.0 Sec (101 Selections)	Stability (Motion) Delay	57
P116.04	Filtr	1 Sec	.065 - 8.00 Sec (8 Selections)	Filter Setting	57
P117.01	Rate=	0.05 Sec	0.05 - 20.0 Sec (201 Selections)	Display Update	57
P118.12	Zrang	100%	.01 - 100% (13 Selections)	Zero Button Range	57
P119.00	LinrZ	Disable	Enable / Disable (Toggle)	Linearization	57
P150.00	Units	lb	lb / kg (Toggle)	Default (Calibration) Units	57
P151.01	Unbut	Enable	Enable / Disable (Toggle)	Units Button	57
P152.00	Unit3	None	None / ounce / gram / lboz (4 Selections)	Additional Unit	57
P161.00	TarSa	Disable	Enable / Disable (Toggle)	Tare Save	58
P166.01	AutoT	Enable	Enable / Disable (Toggle)	Auto Tare	58
P167.01	TarIn	Disable (350I.S.) Enable (355I.S.)	Enable / Disable (Toggle)	Keyboard Tare	58

Parameter Number	Display Name	Default Value	Valid Range/ Choices	Parameter Description	Page
P169.00	AtClr	Disable	Enable / Disable (Toggle)	Auto Tare Clear	58
P171.00	AnAlg	Disable	Enable / Disable (Toggle)	Analog Output Option	58
P179.00	Count	Disable	Enable / Disable (Toggle)	Counting Functions	58
P200.00	Baud1	9600	150 - 115K (13 Selections)	Comm 1 Baud Rate	58
P201.01	Data1	8 Bits	7 - 8 Bits (2 Selections)	Comm 1 Data Bits	58
P202.00	Par 1	None	None - Odd (3 Selections)	Comm 1 Parity	58
P203.00	Stop1	1 Bit	1 - 2 Bits (2 Selections)	Comm 1 Stop Bits	58
P204.02	HndS1	Soft	None - Both (4 Selections)	Comm 1 Handshake	59
P210.01	Send1	Press	Off - ID (5 Selections)	Comm 1 Transmit	59
P212.01	Stbl1	Delay	Off - Delay (Toggle)	Comm 1 Motion	59
P213.01	Ttyp1	--1--	1 - 16, Custom (Selection)	Print Transmission	59
P220.00	Baud2	9600	150 - 115K (13 Selections)	Comm 2 Baud Rate	59
P221.01	Data2	8 Bits	7 - 8 Bits (2 Selections)	Comm 2 Data Bits	59
P222.00	Par 2	None	None - Odd (3 Selections)	Comm 2 Parity	59
P223.00	Stop2	1 Bit	1 - 2 Bits (2 Selections)	Comm 2 Stop Bits	59
P224.02	HndS2	Soft	None - Soft (2 Selections)	Comm 2 Handshake	59
P230.01	Send2	Press	Off - ID (5 Selections)	Comm 2 Transmit	60
P232.01	Stbl2	Delay	Off - Delay (Toggle)	Comm 2 Motion	60
P233.01	Ttyp2	--1--	1 - 16, Custom (Selection)	Print Transmission	60
P260.00	Type	350 I.S.	350 I.S. - Cntrl (4 Selection)	Remote Display Type	60
P290.00	Echo	None	None - Port 2 (3 Selections)	Remote Display Master Echo	60
P291.02	Start	<STX>	0 - 255 (256 Selections)	Master Display Start Character	60
P292.03	End	<ETX>	0 - 255 (256 Selections)	Master Display Ending Character	61

Parameter Number	Display Name	Default Value	Valid Range/ Choices	Parameter Description	Page
P296.00	EStyle	300	300 or 60 (2 Selections)	Remote Display Style Echo Format	61
P410.--	Euro	Disable	Enable / Disable 9991/9990 (Key In)	OIML Enforce	61
P412.--	PrSEt	Disable	Enable / Disable (Toggle)	OIML Enforce	61
P420.01	Dsply	On	Off - Auto (3 Selections)	Display Function	61
P423.00	Light	Off	ON/OFF (Toggle)	Backlight	61
P427.00	Apo	Off	Off - 60 minutes (16 Selections)	Auto Power for Battery Option	61
P440.00	rStrc	Disable	Enable / Disable (Toggle)	NTEP Enforce	62
P500--	Tine	12.00.00	(Keyed In)	Time/Date Function	62
P501--	Date	01.01.70	(Keyed In)	Time/Date Function	62
P502.01	disbl t-dAt	Disable	Enable / Disable (Toggle)	Time/Date Function	62
P503.01	12 hours	12 hour	12 hour/24 hour	Time/Date Function	62
P504.00	Style	U.S.A	U.S.A or International	Time/Date Function	62
P505.01	TdSEL disbl	Disable	Enable / Disable (Toggle)	Time/Date Function	62
P800.00	But1	None	None - Print/Tare (5 Selections)	Remote Button Function	62
P801.00	But2	None	None - Print/Tare (5 Selections)	Remote Button Function	62
P802.00	tZdef	None	None - Port 2 (3 Selections)	Remote Button Function	63
P1000.--	Cust.tran1	--	--	Custom Transmit 1	63
P2000.--	Cust.tran2	--	--	Custom Transmit 2	63
P5000.00	TArGt	Disable	Enable / Disable (Toggle)	Target Key (355 I.S.)	63
P5002.00	StoP	Disable	Enable / Disable (Toggle)	Stop Key (355 I.S.)	63
P5003.00	StArt	Disable	Enable / Disable (Toggle)	Start Key (355 I.S.)	63

Parameter Number	Display Name	Default Value	Valid Range/ Choices	Parameter Description	Page
P5004.00	Chec	Auto	Auto / Start (Toggle)	Restart Mode	63
P5010.00	SPAnn	Enable	Enable / Disable (Toggle)	Setpoint Annunciators	63
P5011.00	SPBar	Disable	Enable / Disable (Toggle)	Bargraph Display	64
P5012.00	BarPc	50%	0 - 100 (Key In)	Bargraph Scaling	64
P5100.00	SetPt	None	None - Checb (9 Selections)	Setpoint Operation	64

4.7 Parameter Map Details

P110 Full Scale Value (Key in)

Denotes the full scale capacity. This value should not exceed the rated capacity of the weighing device.

P111 Division Size (Selection)

Indicates the count-by and decimal point. Pressing [ZERO] + [TARE] (Model 350 I.S.) or [CLR] (Model 355 I.S.) will automatically select the choice closest to 10,000 divisions without exceeding 10,000 divisions.

P112 Zero Track Aperture (Selection)

Set in terms of number of divisions. Zero tracking eliminates small weight deviations at or near zero. Weight deviations within the selected window that have been stable for more than one second are tracked off, maintaining a gross or net zero condition.

The sum of weight values zeroed with auto zero tracking and [ZERO] cannot exceed the allowable zero range (P118).

To determine the proper setting in a counting application, divide the weight of the smallest product counted by the division size (P111). Zero Track should be set to 0 (off) for most setpoint filling operations. This prevents tracking off any product trickle at the start of a fill process.

P114 Stability (Selection)

Stability is defined as weight fluctuations within an aperture that can be regarded as being a stable weight. Deviations outside this aperture are considered motion, and the motion annunciator on the front panel will light accordingly. Once the scale settles within the stability aperture, the indicator will wait for a period of time specified by the motion delay (P115) before the indicator is considered stable.

Print operations configured as motion delayed (P114) will not send the specified data until the weight reflects a stable reading as designated by this setting. Certain setpoint operations are also considered motion delayed and will not change states until a no-motion condition exists.

P115 Stability Delay (Selection)

Selects the stability (motion) time delay to a resolution of 0.1 seconds. For example, an entry of 25 will be accepted as 2.5 seconds.

P116 Filter (Selection)

Sets the indicator response time in terms of seconds. Filtering determines how quickly the indicator will respond to changing input signals. A low filter setting speeds the response, a higher filter setting will 'dampen' the response.

Filtering is used to filter out weight fluctuations caused by outside sources, such as vibrations or air currents.

P117 Rate (Selection)

Specifies how often the display is updated with new data and the rate of continuous transmits (if P210 or P230 are enabled). For example, if 0.05 is selected, the controller will write data to the display and send continuous transmits 20 times a second.

Selections from 0.05 to 20.0 seconds are available. The actual rate may be less than (P117). The actual rate depends on the indicator speed (P60090), the size and number of transmits (P1000, P2000, P210, and P230), and COM ports' speed (if echo (P290) is enabled or continuous transmits are enabled).

P118 Zero Range (Selection)

Specifies how many divisions can be zeroed in terms of a percentage of full scale (P110). The sum of weight values zeroed through the [ZERO] key and auto zero tracking cannot exceed this range.

A zero range of 5% is commonly used with large tank scales to avoid accidental zeroing of a full or partially full tank.

P119 Multi-Point Linearization (Toggle)

Enable the five-point linearization feature used during load cell calibration.

P150 Units (Toggle)

Set default units to 'lb' or 'kg'. The indicator must use the default units during calibration procedures. The default units are the displayed units upon indicator power-up.

P151 Units Button (Toggle)

When enabled, this parameter will allow the [UNITS] key to toggle the units between lb and kg (1000g). When disabled, the indicator will show only the calibration units as determined by P150.

P152 Third Unit (Selection)

This parameter will allow the choice of three additional units (ounces, grams or lb oz) that may be accessed with the [UNITS] key. Only one unit will be available at a time. The third unit can only be selected if P151 is enabled. The additional unit will be identified by an annunciator on the display. This unit selection is not legal for trade.

P161 Tare Save (Toggle)

Enabling Tare Save allows the indicator to retain the tare value in the event of power loss. The correct net weight is restored upon power-up.

P166 Auto Tare (Toggle)

When enabled, pressing [TARE] will wait for a no-motion condition and then bring the scale to a net zero reading. Disabling will prevent keypad tare operations.

Note that if a setpoint activation method is set to [TARE], disabling Auto Tare will also disable the activation of that setpoint.

P167 Keyboard Tare (Toggle)

If P167 is disabled, the user cannot view tare using the select key. A numeric tare (manually entering tare) will not be accepted and show a msg *Funct" "disbl*. The only way a tare value can be entered is by using the automatic tare (press [TARE] to tare the weight on the scale). When P167 is on, the user can view tare using the select key (tare will follow Net). The unit will accept numeric tare. On the Model 355 I.S., users can use the numeric keypad. On the Model 350 I.S., users can use [PRINT] and [UNITS] to scroll in an entry.

P169 Auto Tare Clear (Toggle)

Enabling this feature will cause the current tare value to be cleared to zero every time the indicator stabilizes within ±5 graduations of gross zero.

P171 Analog (Toggle)

Enable or disable the optional analog output module. See Analog Output Setup on page 101 for all parameters associated with the Analog Output Module.

P179 Count (Toggle)

When enabled, the quantity mode becomes accessible via the [SELECT] key. The quantity mode is identified by the illumination of the QTY annunciator.

P200 Baud (Comm 1) (Selection)

Set the desired baud rate for the communication port. 150 - 115K bps

P201 Data Bits (Comm 1) (Toggle)

Select 7 or 8 data bits for the transmission.

P202 Parity (Comm 1) (Selection)

Select Odd, Even or None for the transmission parity.

P203 Stop Bits (Comm 1) (Toggle)

Select 1 or 2 stop bits for communication port transmissions.

P204 Comm Handshake (Comm 1) (Selection)

Select from None, Software (Xon/Xoff), Hardware (CTS/RTS), or Both.

P210 Send (Comm 1) (Selection)

Transmission Send options:

Choice Number	Selection Name	Description
P210.00	Off	All transmissions disabled.
P210.01	Press	Sends transmission with [PRINT] key.
P210.02	Cont.	Sends transmissions continuously.
P210.03	Cycle	Send single transmission after weight is reached and motion ceases. Must return display value below 0.1% of F.S. to reset for next transmission.
P210.04	ID	Sends transmission with the stored ID.

P212 Send Stability (Comm 1) (Toggle)

Enabling Send Stability will delay any transmissions until a no-motion condition exists.

P213 Transmit Selection (Comm 1) (Selection)

Select desired print output (1 - 16 or custom). The transmission will be initiated by the selected print operation (P210) and / or the Remote Key selection (P800). See page 64 for details on preset formats or page 67 for details on custom transmit.

P220 Baud (Comm 2) (Selection)

Set the desired baud rate for the communication port. 150 - 115K bps.

P221 Data Bits (Comm 2) (Toggle)

Select 7 or 8 data bits for the transmission.

P222 Parity (Comm 2) (Selection)

Select Odd, Even or None for the transmission parity.

P223 Stop Bits (Comm 2) (Toggle)

Select 1 or 2 stop bits for communication port transmissions.

P224 Comm Handshake (Comm 2) (Selection)

Select from None and Software.

P230 Send (Comm 2) (Selection)

Transmission Send options:

Choice Number	Selection Name	Description
P230.00	Off	All transmissions disabled.
P230.01	Press	Sends transmission with [PRINT] key.
P230.02	Cont.	Sends transmissions continuously.
P230.03	Cycle	Send single transmission after weight is reached and motion ceases. Must return display value below 0.1% of F.S. to reset for next transmission.
P230.04	ID	Sends transmission with the stored ID.

P232 Send Stability (Comm 2) (Toggle)

Enabling Send Stability will delay any transmissions until a no-motion condition exists.

P233 Transmit Selection (Comm 2) (Selection)

Select desired print output (1 - 14 or custom). The transmission will be initiated by the selected print operation (P210) and / or the Remote Key selection (P800). See page 64 for details on preset formats or page 67 for details on custom transmit.

P260 Master, Remote Display or Safe Area Hub (Selection)

Select the mode of operation.

Choice Number	Selection Name	Description
P260.00	350 I.S. / 355 I.S.	Sets indicator as the master device.
P260.01	R-dsp	Sets the indicator as a slave device. P261 - P283 will be available.
P260.02	Hub.	Sets the indicator to a safe area hub.
P260.03	Cntrl	Sets the indicator to the master controller for fiber-optic interface to the safe area hub.

P290 Echo Display (Toggle)

Determines which comm. port will be echoed to another device. Selections are None, port 1, port 2.

P291 Start Character (Key-in)

Set the start character for the master indicator. Choices are 0 - 255. Default value is 2 (STX). The choice must match the start character at P274 of the remote display (slave). A value of 0 means that a byte with the value 0 will be sent for the character. Avoid using values of 17 or 19 when using software flow control. The values of 17 and 19 are Xon and Xoff codes and could cause conflict.

P292 End Character (Key-in)

Set the end character for the master indicator. Choices are 0 - 255. Default value is 3 (ETX). The choice must match the end character at P275 of the remote display (slave). A value of 0 means that a byte with the value 0 will be sent for the character. Avoid using values of 17 or 19 when using software flow control. The values of 17 and 19 are Xon and Xoff codes and could cause conflict.

P296 Echo Style (Toggle)

Set the style of indicator the display will be echoed to. The choices are 300 or 60. The 300 choice is for 350, 355, 350 I.S., 355 I.S., 351, ABS 4100. Choose 60 for 460 series, 560 series and 660 series indicators.

P410 Euro (Toggle)

Enable OIML legal-for-trade restrictions (see page 127).

P412 Preset Character (Toggle)

If P412 is enabled, it will add a 'P' to the beginning of the tare parameter on the display and transmits if the last tare value was entered manually by the user (numeric entry). P167 needs to be enabled in order to key in a tare value. A 'P' will not be added if the last tare was performed by pressing the tare key or if the tare value is zero (even if the zero value was manually entered by the user). The 'P' prefix stands for "Preset". When P412 is disabled, the unit will never show 'P' before tare no matter how tare is entered.

P420 Display (Selection)

Select display control option. Choose from On, Off or Auto. The auto setting helps conserve power for extended battery life. When the indicator display is off, the load cell(s) are still powered.

If P420 is set to Off or selection 0, you can turn on the display by holding down the [ZERO] key upon power up. This does not set P420 to On; it only temporarily turns on the large VFD display in order to allow you to see what you are entering.

Choice Number	Selection Name	Description
P420.00	Off	Shuts off the display.
P420.01	On	Normal display operation.
P420.02	Auto	Shuts off the display when weight has stabilized within 6 divisions for 5 minutes. Pressing [ON] or changing weight more than 6 divisions will re-enable the display. NOTE: The display will turn back on if data is received via the RS-232 Port.

P423 Back Light (on/off)

Toggle the backlight on a Model 350/355 I.S. LCD.

P427 Battery Option Automatic Shutdown (Selection)

Select duration of time for auto shutdown. Choose from selections with the [TARE] key. Selections are off, 0.5, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, 40, 45, and 60. The choices are set in minutes.

P440 Legal for Trade Restrictions (Toggle)

Enable NTEP legal-for-trade restrictions. See section 6.1 for details.

P500 Time Setting (key in)

Enter the time in the form HH.MM.SS. Time is always shown in military format within this parameter. P503 will determine how the time is displayed in the weigh mode.

P501 Date Setting (key in)

Enter the date in the form MM.DD.YY. P504 will determine the how the date is displayed in the weigh mode.

P502 Time/Date (toggle)

Enables or disables the time and date feature. If enabled the time and date will be accessible from the weigh mode with the [SELECT] key. The weight will continue to be updated when viewing the time or date. The time will be formatted as defined by P503 and the date will be formatted as defined by P504. See page 73 for instructions on how to change the time and/or date.

P503 Hours (toggle)

Determines the TIME format style, 12 hour or 24 hour. If in 12 hour mode the right most decimal point on the display will become the PM indicator. Note: The time must be entered as military time. If the mode is set for 12 hour, the time will be converted to a 12 hour clock.

P504 Style (toggle)

Determines the DATE format style, U.S.A. or Int'l. If set for U.S.A, the date will resemble 01/26/01. If set for international, the date will resemble 26/01/01.

P505 Time/Date Select (toggle)

Enables or disables the editing of time and date the weigh mode.

P800 Remote Key 1 Operation (Selection)

Select function for Remote Key closure. Choose from None, Print, Tare, Zero or Print/Tare. If a setpoint is configured to use the remote key as an activation method, then the P800 setting is over-ridden. The Remote Key Configuration section on page 75 details the remote key operation. See Remote Key Connection on page 35 for remote key electrical connections.

P801 Remote Key 2 Operation (Selection)

Select function for Remote Key closure. Choose from None, Print, Tare, Zero or Print/Tare. If a setpoint is configured to use the remote key as an activation method, then the P801 setting is over-ridden. The Remote Key Operation section on page 75 details the remote key operation. See Remote Key Connection on page 35 for remote key electrical connections.

P802 Tare and Zero Execution (Selection)

When a Zero or Tare event happens the scale will transmit *Tare Executed* or *Zero Executed* <CR> <LF> followed by the transmit specified at P213 (port 1) or P233 (port 2). The port number needs to be selected within this parameter.

P1000 Custom Transmit 1

A custom transmit is a user-defined string of data that can be sent to the serial port. Parameter P1000 is the beginning of the custom transmit table for transmit 1and must be enabled for transmit by selecting cust at P213. Parameters use three bytes of memory; ASCII characters and control codes use one byte. See P60001 for available memory. The custom transmit cannot be viewed or altered from the indicator. A custom transmit must be entered via the serial port. See Custom Transmit Setup on page 67 for details on designing and loading a custom transmit.

P2000 Custom Transmit 2

A custom transmit is a user-defined string of data that can be sent to the serial port. Parameter P2000 is the beginning of the custom transmit table for transmit 2 and must be enabled for transmit by selecting cust at P230. Parameters use three bytes of memory; ASCII characters and control codes use one byte. See P60001 for available memory. The custom transmit cannot be viewed or altered from the indicator. A custom transmit must be entered via the serial port. See Custom Transmit Setup on page 67 for details on designing and loading a custom transmit.

P5000 Target Key (Toggle)

Allows a target value to be entered or viewed. Sending a % <CTRL-A> using a serial device such as a computer is equivalent to pressing the Target key.

P5002 Stop Key (Toggle)

Enable or disable the use of the stop key from the 355 I.S. keypad. Pressing the stop key in the gross, net, tare, APW or quantity modes with setpoint(s) enabled will cause all setpoints to deactivate and pause. Sending a % <CTRL-F> using a serial device such as a computer is equivalent to pressing the Stop key.

P5003 Start Key (Toggle)

Enable or disable the use of the start key from the 355 I.S. keypad. Pressing the Start key in the gross, net, tare, APW or quantity modes with setpoints enabled causes a paused setpoint operation to be resumed. Sending a % <CTRL-E> using a serial device such as a computer is equivalent to pressing the Start key.

P5004 355I.S. Restart Checkweighing Mode (Toggle)

Determines the method in which the checkweighing mode will be restarted. Auto will restart after return to zero or Manual will restart by pressing the [START] key. If Stop (P5002) is disabled, this function is disabled and parameter 5004 will not appear.

P5010 Setpoint Annunciators (Toggle)

Enables or disables the setpoint annunciators to the left of the main 7-segment display. Disabling the setpoint annunciators may be desired when the bargraph is enabled while using an LCD display.

P5011 Setpoint Bargraph (Toggle)

Enables or disables the bargraph display on the LCD version of the Model 350/355 I.S. display. This setup parameter only appears if an LCD display is installed.

P5012 Setpoint Bargraph Low-Limit Percentage (Key in)

Controls the bargraph low-limit percentage value for determining the weighting of each segment of the bar graph. This only appears if an LCD display is installed.

P5100 Setpoint Operation (Selection)

Sets the desired Setpoint operation. Choose between None, ChecP, Fill, Batch, Discharge, Both, ChecA or Independent. See Setpoint Setup on page 77 for complete details on setpoint setup and operation.

4.8 Preset Transmit Selections

The Model 350 I.S. and Model 355 I.S. provide 16 preset formats for printing tickets or sending data to a computer. Only one format or custom transmit may be enabled at a time.

Choice 0: Custom Transmit:

User-defined serial data string (see Custom Transmit Setup on page 67).

Choice 1: GSE Standard Transmit:

HH:MM:SS am MM/DD/YY <CR><LF>
XXX.XX kg Gross<CR><LF>
XXX.XX kg Tare <CR><LF>
XXX.XX kg Net <CR><LF>

Choice 2: Count:

HH:MM:SS am MM/DD/YY <CR><LF>
XXX QTY <CR/LF>
XX.X kg APW <CR><LF>
XXX.XX kg Gross<CR><LF>
XXX.XX kg Tare <CR><LF>
XXX.XX kg Net <CR><LF>

(NOTE: The time and date will only be printed in choice 1 and 2 if P502 is enabled).

Choice 3: (Condec Clone):

<STX> <POL> <DATA> <L/K> <G/N> <STAT> <CR> <LF>

Where:

<STX> is a single control code, decimal value of 2.

<DATA> is 8 characters, 1st character is either minus sign or a space, padded with leading spaces, with an embedded decimal point.

<L/K> is a single 'L' or 'K' character to indicate lb or kg units.

<G/N> is a single 'G' or 'N' character to indicate gross or net data.

<STAT> is an 'O' (overload/underload), 'M' (motion), or space otherwise.

<CR> is a single control code (carriage return), decimal value of 13.

<LF> is a single control code (line feed), decimal value of 10.

Choice 4:
<STX><SignedDATA><sp><lb/kg><sp><Gross/Net/Qty><STAT><CR>

Choice 5:
<STX><Signed DATA><sp><lb/kg><STAT><CR>

Choice 6:
<STX><Signed DATA><sp><lb/kg><CR>

Choice 7:
<STX><Unsigned DATA><sp><CR>

Choice 8:
<STX><Signed DATA><sp><lb/kg><sp><Gross/Net/Qty><STAT><SPS><CR>

Choice 9:
<STX><Signed DATA><sp><lb/kg><STAT><SPS><CR>

Choice 10:
<STX><Signed Displayed Weight><sp><lb/kg><SPS><CR>

Choice 11:
<STX><Unsigned Displayed Weight><SPS><CR>

Choice 12:
<STX><Unsigned DATA><sp><lb/kg><sp><Gross/Net/Qty><STAT><CR>

Use choice 12 to send to a 450/455/550 remote display that is set to text mode and a <CR> terminator.

Choice 13:
<STX><Unsigned DATA><sp><lb/kg><sp><Gross/Net/Qty><STAT> <CR><LF>

Choice 14: (Simulates NCI 3835):

<LF>Signed DATA<CR><LF><STAT><CR><ETX>

Data Block Name	Description
<STX>	A single control code, decimal value of 2.
<ETX>	A single control code, decimal value of 3.
<POL>	A <space> for positive data or a - for negative data
<Signed DATA>	8 characters right justified, space padded, including a decimal point and polarity sign. Polarity is a '+' or '-' to the immediate left of the most significant digit.
<Unsigned DATA>	8 characters right justified, space padded, including a decimal point.
<lb/kg>	Two characters indicating pounds or kilograms.
<Gross/Net/QTY>	Single word for gross weight, net weight or quantity.
<STAT>	An 'O' (overload/underload), 'M' (motion), or <space> otherwise
<SPS>	See <SPS> Setpoint Status below.
<CR>	A single control code, decimal value of 13.
<LF>	A single control code, decimal value of 10.
<sp>	ASCII Space, decimal value of 32.

<SPS> Setpoint Status

Transmitting the setpoint status will reflect the current state of all the setpoints, regardless of which setpoint operation is configured. The status can be read as a single ASCII numeric character (0-7), a Hex value (30h-37h) or a binary bit comparison. Status is preceded by a <space> and an "S". The preceding data stream format is for fixed transmissions of <SPS> as specified above. This is not associated with the custom transmission of parameter P96.

SP 1	SP 2	SP3	ASCII	Hex	Bit Comparison
Off	Off	Off	0	30h	0011 0000
On	Off	Off	1	31h	0011 0001
Off	On	Off	2	32h	0011 0010
On	On	Off	3	33h	0011 0011
Off	Off	On	4	34h	0011 0100
On	Off	On	5	35h	0011 0101
Off	On	On	6	36h	0011 0110
On	On	On	7	37h	0011 0111

Choice 15: (RSD 3000):

<STX><G>< Signed DATA ><lb/kg><CR><LF>
<STX><SPS><CR><LF>

Choice 16: (RSD 3000):

<STX><N>< Signed DATA ><lb/kg><CR><LF>
<STX><SPS><CR><LF>

4.9 ID Number Entry and Printing

It is possible to enter an ID number and have the number print out on a ticket. This mode is accessed from the weigh mode by entering [21] [SELECT]. The first six digits of the existing ID number will be displayed. An alphanumeric ID of up to 50 characters can be entered. At this point a new ID number can be entered or the existing number may be cleared.

In order for the ID number to be printed, the following criteria must be met.

- P210 or P230 must be set to ID. If the desired parameter(s) is set to another value, the indicator will not prompt for an ID entry.
- P213 or P233 must be set for cust. If the parameters are not set for custom, the ID will not be printed.
- P1000 or P2000 must contain parameter 21 (ID).

4.9.1 Enter an ID from the weigh mode:

1. Press the [PRINT] key from the weigh mode. The display will show the current ID number if one has been entered previously.
2. Key in the desire ID number (numeric and/or alphanumeric) and press [TARE] (Model 350 I.S.) or [ENTER] (Model 355 I.S.). This will print a ticket.

   or

2a. If the ID number shown is acceptable simply press [TARE] (Model 350 I.S.) or [ENTER] (Model 355 I.S.). This will print a ticket.

4.10 Elements of a Custom Transmit

Parameters, ASCII text, and control codes are the elements of a custom transmit.

Parameters

Certain parameters related to weight, quantity, setpoints, ID and status could be sent out of the comm port. Gross Weight, Target 1 and Quantity are examples of printable parameters.

ASCII Text

ASCII text can be entered into a custom transmit to provide further detail of a transaction. "P", "@" and "+" are examples of ASCII text.

Control Codes

You can custom transmit ASCII control codes to control a printing device. <CR> (carriage return) and <FF> (form feed) are examples of control codes. When entering a control code in a custom transmit table, use three digits preceded by a decimal point. Example: Start of Text <STX> = 2. Key in [.002].

4.10.1 Writing A Custom Transmit ASCII Text File

Any text editor may be used to construct a custom transmit (Notepad, Wordpad, Communication Plus, etc.), but you must save the custom transmit as a text (.txt) file. Instructions can also be sent keystroke by keystroke from a communications program. To do so, ignore the Model 350/355 I.S. display and enter the characters in the correct order. Figure 4.1 shows a custom transmit written in Wordpad.

4.10.2 Access Setup and Clearing Existing Custom Transmit

Every custom transmit file must start with:

1999%s%s%z%p%u%e
%c%e

This accesses the Setup Mode at the end of the existing transmit and then clears the transmit so that a new one may be entered.

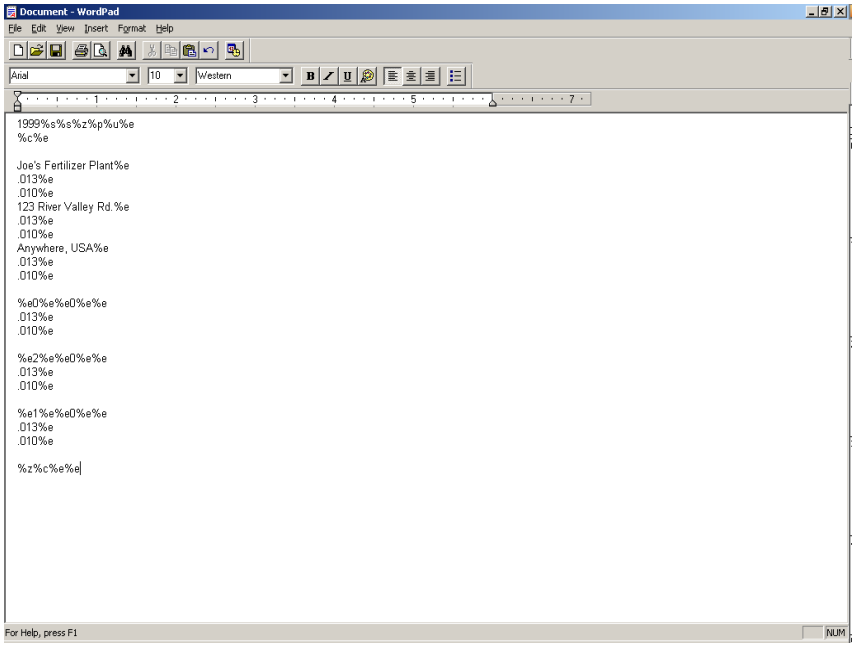


Figure 4.1 Custom Transmit File

4.10.3 Entering ASCII Text

ASCII text is defined as printable characters, including alpha-numeric as well as punctuation and symbols. See Table 4.1 for a complete listing of ASCII characters. ASCII text can be entered directly into a custom transmit with a %e (enter command). For example, Joe's Fertilizer Plant%e.

4.10.4 Entering ASCII Control Codes

Some ASCII characters are known as control codes, non-printable characters that instruct a printing device to perform certain functions. For example, a carriage return <CR> forces a printer to move the print head to the left-most position of the current line. A line feed <LF> forces the print head to move down one line. Enter control codes with a decimal point, a 3-digit ASCII code, and a %e. For example, .013%e.

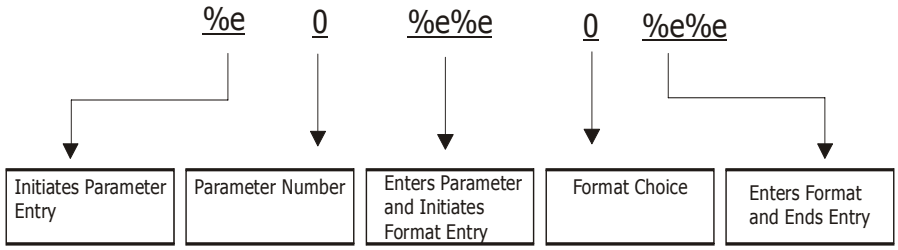
hex	CHAR	dec	hex	CHAR	dec	hex	CHAR	dec	hex	CHAR	dec	hex	CHAR	dec
00	**NUL**	000	1A	**SUB**	026	34	**4**	052	NE	**N**	078	68	**h**	104
01	**SOH**	001	1B	**ESC**	027	35	**5**	053	4F	**O**	079	69	**i**	105
02	**STX**	002	1C	**FS**	028	36	**6**	054	50	**P**	080	6A	**j**	106
03	**ETX**	003	1D	**GS**	029	37	**7**	055	51	**Q**	081	6B	**k**	107
04	**EOT**	004	1E	**RS**	030	38	**8**	056	52	**R**	082	6C	**l**	108
05	**ENQ**	005	1F	**US**	031	39	**9**	057	53	**S**	083	6D	**m**	109
06	**ACK**	006	20	**SP**	032	3A	**:**	058	54	**T**	084	6E	**n**	110
07	**BEL**	007	21	**!**	033	3B	**;**	059	55	**U**	085	6F	**o**	111
08	**BS**	008	22	**"**	034	3C	**<**	060	56	**V**	086	70	**p**	112
09	**HT**	009	23	**#**	035	3D	**=**	061	57	**W**	087	71	**q**	113
0A	**LF**	010	24	**$**	036	3E	**>**	062	58	**X**	088	72	**r**	114
0B	**VT**	011	25	**%**	037	3F	**?**	063	59	**Y**	089	73	**s**	115
0C	**FF**	012	26	**&**	038	40	**@**	064	5A	**Z**	090	74	**t**	116
0D	**CR**	013	27	**'**	039	41	**A**	065	5B	**[**	091	75	**u**	117
0E	**SO**	014	28	**(**	040	42	**B**	066	5C	****	092	76	**v**	118
0F	**SI**	015	29	**)**	041	43	**C**	067	5D	**]**	093	77	**w**	119
10	**DLE**	016	2A	*****	042	44	**D**	068	5E	**^**	094	78	**x**	120
11	**DC1**	017	2B	**+**	043	45	**E**	069	5F	**_**	095	79	**y**	121
12	**DC2**	018	2C	**'**	044	46	**F**	070	60	**`**	096	7A	**z**	122
13	**DC3**	019	2D	**-**	045	47	**G**	071	61	**a**	097	7B	**{**	123
14	**DC4**	020	2E	**.**	046	48	**H**	072	62	**b**	098	7C	**|**	124
15	**NAK**	021	2F	**/**	047	49	**I**	073	63	**c**	099	7D	**}**	125
16	**SYN**	022	30	**0**	048	4A	**J**	074	64	**d**	100	7E	**~**	126
17	**ETB**	023	31	**1**	049	4B	**K**	075	65	**e**	101	7F	**DEL**	127
18	**CAN**	024	32	**2**	050	4C	**L**	076	66	**f**	102			
19	**EM**	025	33	**3**	051	4D	**M**	077	67	**g**	103			

Table 4.1 ASCII / Hexadecimal Conversion Chart

Most printers require a carriage return (.013) and/or a line feed (.010) to print preceding data and avoid leaving data in the printer buffer.

4.11 Parameter Selection Numbers

The following sequence enters parameters into a custom transmit: %e, the parameter number, %e%e , a format code, and then %e%e with no intervening spaces.



Parameter Name	Parameter Number	Sample Print Output
Gross Weight	0	27.49 lb Gross
Net Weight	1	14.53 lb Net
Tare Weight	2	12.96 lb Tare
Time / Date	11	10:01:01 am 01/26/01
ID	21	ID: 12MN53
Quantity	30	58 Qty
APW	34	0.25 lb APW
APW * K	35	250 lb APW * K
Targ1	60	400 lb Targ1
Targ2	64	500 lb Targ2
Targ3	66	1000 lb Targ3
Act 1 (note: Indp. SP1)	70	600 lb Act 1
Rst 1 (note: Indp. SP1)	71	10 lb Rst 1
Act 2 (note: Indp. SP2)	72	300 lb Act 2
Rst 2 (note: Indp. SP2)	73	10 lb Rst 2
Act 3 (note: Indp. SP3)	74	100 lb Act 3
Rst 3 (note: Indp. SP3)	75	5 lb Rst 3
Setpoint Status	96	Setpt 0
Stability Status	97	Stat M
Displayed Value	98	16.34 lb Gross

Table 4.2 Custom Transmit Parameter Selection Numbers

The default format code for all parameters is 0. This prints all numeric data with 8 characters, right justified, left spaces filled, the units (if applicable) and the parameter name. The format choices for all parameters (except Stability Status and Setpoint Status) are shown in the following table.

Choice	Sample Print Result	Description
Weight Parameter Format Codes		
0	" 27.49 lb Gross"	Fixed width (8 characters), right justified, left spaces filled.
1	"000027.49 lb Gross"	Fixed width (8 characters), right justified, left zeroes filled.
2	"27.49 lb Gross"	Fixed width, left justified, right spaces filled.
3	"27.49 lb Gross"	Minimum possible width.
8	"400. lb Net"	Print decimal point, even if data has no fractional portion.
16	"+400 lb Net"	Print "+" for positive numbers.
32	"336.52 Net"	Do NOT print parameter units (lb or kg).
64	"336.52 lb Net"	Print value in "default" units (as opposed to current viewed units).
128	"336.52 lb"	Do NOT print parameter name. Only Format Code that applies to ID
Time / Date Format Codes		
1	"10:07:40 am 10/26/09	Includes seconds with time.
2	"10:08 10/26/09"	24 hour time format.
4	"10:11 am Oct 26, 2009"	Print date spelled out.
8	"10:12 am Fri 01/26/01"	Print day of the week.
16	"10:12 am 26/10/09"	International date format.
32	"980503984 Tm/Dt"	# of seconds since 12:00 AM Jan 1, 1970.
64	"10/26/09"	Do NOT print time.
128	"10:14 am"	Do NOT print date.

4.11.1 Exiting Setup Mode and Saving Changes

Each custom transmit file must end with:

%z%c%e%e

This exits the Setup Mode, bypasses the calibration procedure and saves the indicator configuration file.

4.12 Parts Counting

The counting parameter must be enabled before using. Follow the instructions below for sampling and counting parts. A new sample must be performed for each unique part being counted. The indicator will not store the average piece weight.

Parameter (P170) must be enabled before parts counting is accessible. See page 48 for details on selecting a specific parameter.

4.12.1 Model 350 I.S.

Sample selectable fixed counts from the weigh mode

1. From the weigh mode, press [SELECT] until the QTY annunciator is lit. The display may show *do APS* if an average piece weight is not found. This message is to let you know this is a new sample. Go to step 2.
2. Press [TARE] to perform a sample. *Add 10* will be displayed. If 10 is the desired sample size, go to step 4. Otherwise go to step 3.
3. If a fixed sample size other than 10 is desired, press [SELECT] to toggle through sample size choices 5, 10, 20, 50 and 100. When the desired sample size is displayed, go to step 4.
4. Add the pieces to be sampled and press [TARE]. After motion is stabilized, the sampled quantity will be displayed.
5. Continue adding parts to be counted. The display will show the number of parts added.

5a. If a different part needs to be counted, go to step 2.

To sample using variable counts

1. From the weigh mode, press [SELECT] until the QTY annunciator is lit. The display may show *do APS* if an average piece weight is not found. This message is to let you know this is a new sample. Go to step 2.
2. Press [TARE] to perform a sample. *Add 10* will be displayed.
3. Add pieces and key in the number of pieces being sampled by entering the known sample size. First press the [PRINT] key until the first digit is displayed. Use the [UNITS] key to move to the next digit. Continue using the [PRINT] and [UNITS] keys until the desired sample size is displayed and press [TARE].
4. Add the pieces to be sampled and press [TARE]. After motion is stabilized, the sampled quantity will be displayed.
5. Continue adding parts to be counted. The display will show the number of parts added.

5a. If a different part needs to be counted, go to step 2.

View the average piece weight

1. From the QTY mode, press [SELECT] once. The display will show *APS* and then flash the last sampled average piece weight. This value cannot be altered.
2. Press the [SELECT] key to exit the average piece weigh mode. Continue to press [SELECT] until the desire weigh mode parameter is displayed.

4.12.2 Model 355 I.S.

To sample using selectable fixed counts from the weigh mode

1. From the weigh mode press [ENTER]. *Add 10* will be displayed. If 10 is the desired sample size, go to step 3. Otherwise go to step 2.

1a. If a fixed sample size other than 10 is desired, press [SELECT] or [UNITS] to toggle through sample size choices 5, 10, 20, 50 and 100. When the desired sample size is displayed, go to step 3.

2. Add the pieces to be sampled and press [ENTER]. After motion is stabilized, the sampled quantity will be displayed.

3. Continue adding parts to be counted. The display will show the number of parts added.

3a. If a different part needs to be counted, go to step 2.

To sample using variable counts

1. From the weigh mode press [ENTER]. *Add 10* will be displayed.

1a. If 10 is the desired sample size, go to step 3. Otherwise go to step 2.

2. Add pieces and key in the number of pieces being sampled with the numeric keys. Press [ENTER] to accept the entry.

3. Add the pieces to be sampled and press [ENTER]. After motion is stabilized, the sampled quantity will be displayed.

4. Continue adding parts to be counted. The display will show the number of parts added.

4a. If a different part needs to be counted, go to step 2.

View the average piece weight

1. From the QTY mode, press [SELECT] once. The display will show *APS* and then flash the last sampled average piece weight. This value cannot be altered.

2. Press the [SELECT] key to exit the average piece weigh mode. Continue to press [SELECT] until the desire weigh mode parameter is displayed.

4.13 Set Time & Date

The time and date feature is stored as non-volatile (time/date setting will not be lost when the unit power is reset).

The time and date can be accessed from the weigh mode with the [SELECT] key if the time/date parameter has been enabled. Time and date can be accessed via the communication port by sending 11%s.

4.13.1 Model 350 I.S.

To enter the time from the Enter~tine~00.00.00 prompt

EXAMPLE: 16.32.41 (4:32:41 P.M.)

1. Press [PRINT] to toggle through the numbers to enter the hour. Hours must be entered as military time.
2. Press [UNITS] once to move the cursor. Press [PRINT] to select the next digit.
3. Press [UNITS] twice to move the decimal point over to separate the hour from the minutes. It is not necessary to enter a 0 before a single digit hour.

To enter the date from the Enter~date~01.01.70 prompt

EXAMPLE: 01.09.11 (January 9, 2011)

1. Press [PRINT] to toggle through the numbers to enter the month.
2. Press [UNITS] twice to move the decimal point over to separate the month from the day. It is not necessary to enter a 0 before a single digit month. If it is a double-digit entry, press [UNITS] once to move the cursor and then [PRINT] to scroll through the digits.
3. Press [PRINT] to toggle through the numbers to enter the day.
4. Press [UNITS] twice to move the decimal point over to separate the day from the year. It is not necessary to enter a 0 before a single digit month. If it is a double-digit entry, press [UNITS] once to move the cursor and then [PRINT] to scroll through the digits.
5. Press [PRINT] to toggle through the numbers to enter the year.
6. Press [UNITS] once to move the cursor and then press [PRINT] to scroll through the digits.
7. Press [TARE] twice to accept the entry.

4.13.2 Model 355 I.S.

To enter the time from the Enter~tine~00.00.00 prompt

EXAMPLE: 16.32.41 (4:32:41 P.M.)

1. Key in the date in the following format: 16.32.41
2. Press [ENTER] to except the time and move to the weigh mode.

To enter the date from the Enter~date~01.01.70 prompt

EXAMPLE: 01.09.11 (January 9, 2011)

1. Key in the date in the following format: 1.9.11. It is not necessary to enter a 0 before a single digit month.
2. Press [ENTER] to except the date and move to the time entry. Press [ENTER] again to bypass the time entry.

4.14 Remote Key Configuration

The Model 350 and Model 355 I.S. have four selectable remote key operations to choose from: Print, Tare, Zero and Print/Tare. Only one of these operations may be assigned to the remote key input. The table below describes the available remote key operations. See Remote Key Connection on page 35 for information on connecting a remote key input device.

Remote Key 1 and 2 Selections	Function	Description
P800.00 or P801.00	None	Remote key disabled.
P800.01 or P801.01	Print	Initiates print function. Print restrictions (P200 - P212) will be adhered to.
P800.02 or P801.02	Tare	Initiates tare function. Tare restrictions (P161 - P169) will be adhered to.
P800.03 or P801.03	Zero	Initiates zero function. Zero restrictions (P118) will be adhered to.
P800.04 or P801.04	Print and Tare	Initiates print function and then tare function. (P200 - P212) will be adhered to. Also (P161 - P169) will be adhered to.

Tare, Zero and Print functions will be delayed according to the stability setting (P114). If a setpoint operation is configured to use the remote key as an activation method, the P800 setting is over-ridden.

4.15 Upgrade Indicator Firmware

The Model 350 I.S. and Model 355 I.S. have flash memory on the main board where the parameters are stored. It is possible to update the firmware simply by using a computer. The firmware is loaded into a flash memory IC. This allows for ease in loading firmware updates.

The flash memory on the main processor is only rated to be reflashed up to 10 times under extreme industrial and temperature conditions.

4.15.1 Prepare For Upgrade

Before the indicator firmware can be updated, the procedure below must be followed. A computer with a serial port or USB port is required for loading a flash file. If you are using a USB port, a USB to serial converter is necessary.

1. Connect the communication cable from the computer to comm 1 of the Model 350 I.S. or Model 355 I.S.

2. Open a communications program or terminal window program (such as Communication Plus) on the computer.

3. Set the protocol of the indicator to be 9600 baud, 1 stop bit, no parity.

4. Set the computer protocol to be 9600 baud, 1 stop bit, no parity.

5. Go to parameter 65020 (re-flash) and press [TARE] (350 I.S.) or [ENTER] (355 I.S.). Press [TARE] (350 I.S.) or [ENTER] (355 I.S.) at the "ARE YOU SURE ? prompt. Press [TARE] (350 I.S.) or [ENTER] (355 I.S.) at the Enter = Flash prompt.

    or

5a. Unplug the indicator and move Reflash jumper (E2) from NORMAL to RFLASH.

6. The terminal program should show:

    GSE Scale Systems
    300 Series Bootloader Version XX (where XX should be at least 03)
    Date (where Date should be at least Feb 2004)
    a.Erase Flash
    b.Program Flash
    c.Set Baud Rate
    d.Quit

7. Set the indicator baud rate in the terminal software to the desired baud rate by entering **c** from the computer keyboard. Set the baud rate in the terminal program to match the baud rate chosen for the indicator. See the table below for baud rates and time for upload.

Baud Rate	Approximate Upload Time
9600	10 - 15 minutes
38400	2 - 5 minutes
57600	1 - 3 minutes

4.15.2 Load Flash File

1. The current flash file must be erased. Enter **a** from the computer keyboard. When finished the menu choices will be replicated.

2. To program flash, enter **b** from the computer keyboard. Open the flash file from your terminal window and send it to the indicator. After the file loads the menu choices will be replicated.

3. To end the flash process, enter **d** from the computer keyboard to quit. The indicator will restart.

4. If the Reflash jumper (E2) was set to REFLASH, unplug the indicator and return the jumper to the NORMAL position.

5. In order to enable the Model 355 I.S. keypad you must cycle power and hold the [ENTER] key on power up.

5a. If Ch#### is displayed after reflashing then the reflash failed. Use the reflash jumper to force reentry into reflash menu and reprogram again.

4.16 Setpoint Setup

The Model 350/355 I.S. has several pre-programmed scale setpoint applications available at P5100. Various related setpoint parameters may appear according to which of the standard programs is chosen. Table 4.3 describes the available setpoint operations.

Setpoint Selection Parameter	Function	Description	Page Ref
P5100.00	None	Setpoints disabled.	--
P5100.01	ChecP	Percentage check-weighing. Over/Under tolerances are based on a percentage of the target weight.	80
P5100.02	Fill	Single Ingredient Fill (Single or Dual-Speed). Allows the use of pre-acts for dribble feed and compensation for free-fall material. Includes a selectable 'learn' mode.	82
P5100.03	Batch	Batch up to three ingredients. Allows for the use of pre-acts to compensate for free-fall material. Includes selectable 'learn' modes.	84
P5100.04	Dschg	Single Ingredient Discharge (Single or Dual-Speed). Allows the use of pre-acts for dribble feed and compensation for free-fall material. Includes a selectable 'learn' mode.	87
P5100.05	Both	Single Ingredient Fill and Discharge. Fill large holding vessels and discharge material in pre-determined amounts. Allows for the use of pre-acts to compensate for free-fall material. Includes a selectable 'learn' mode.	90
P5100.06	ChecA	Absolute check-weighing. Over/Under tolerances are based on discrete values.	93
P5100.07	Indep	Independent Setpoints. Activation based on specific target values. Includes selectable reset conditions.	99
P5100.08	Checb	Target Deviation check-weighing. Over/Under tolerances are deviated from the target weight.	95

Table 4.3 Setpoint Operations

Each program utilizes the three annunciators located to the left of the main display to give a visual status of the setpoint. A setpoint option board may be installed in the safe area via Fiber-Optic hub to allow control of an external device.

4.16.1 Activation Methods

Setpoint activation for Fill, Batch, Discharge, and Both can be initiated in one of four ways: Tare, Remote, Auto and Start key (355 I.S. only). Check-weigh operations have no start function but there are two methods of restarting. See parameter 5004 on page 63 for more details. Independent setpoint operations are limited to Above or Below activation. The Model 350 I.S. and Model 355 I.S. setpoint option board may be connected in-series with a larger automated control system or a manually activated switching device. A foot switch, a two-hand safety station, or other permissive-start devices may be used for safety or system compatibility.

Activation Method (P5003)	Description
Tare Operation	The [TARE] activates the setpoint. It waits for a no-motion condition, then tares scale to net zero. The appropriate setpoint is then activated.
Remote Key 1	(START key)
355 I.S. only	The [START] key activates the setpoint. The remote key function (assigned at P800) is over-ridden. A setpoint and P5003 must be enabled for the start key to operate.
Remote Key 2	(STOP key)
355 I.S. only	The [STOP] key activates the setpoint. The remote key function (assigned at P801) is over-ridden. A setpoint and P5002 must be enabled for the start key to operate.
Auto-Start	Automatically activates the setpoint after motion ceases.

4.16.2 Pre-Acts

Pre-Acts are control actions prior to reaching a desired target value. Necessary to prevent over-filling due to product flow rate, relay and valve response time and product suspension, Pre-Acts compensate for other system variables affect how much more product reaches the weighing device after the indicator has deactivated a setpoint.

Pre-act 1

Used in dual-speed applications, pre-act 1 specifies when the Model 350/355 I.S. should switch from fast-fill to slow-fill, allowing the system to perform the bulk of a filling operation as quickly as possible before switching to a more manageable dribble mode for final cutoff. When using a single-speed device, set pre-act 1 to 0.

Pre-act 2

Specifies the weight where the final cutoff should occur, enabling the Model 350/355 I.S. to compensate for a dispensing control's closure time and account for free-fall material. Free-fall is the amount of product that has passed the point of the dispensing control yet not yet reached the weighing device.

Pre-act values are entered in terms of the amount of product that would over-fill or how early to close the control device. For instance, after repeated tests, a system consistently over-fills by .5 lbs. This is the value that should be entered as the pre-act. The Model 350/355 I.S. would then deactivate the setpoint .5 lbs. less than the desired final target value.

Parameter Setting	Actual Cutoff Value	Comments
Target = 400 lbs.		Desired final weight.
Pre-Act 1 = 28	400 - 28 = 372	Switch to slow feed at 372 lbs.
Pre-Act 2 = .5	400 - 0.5 = 399.5	Final fill valve closes at 399.5 lbs.

4.16.3 Learn Feature

The Model 350/355 I.S. can learn optimal pre-act values. When enabled, the learn feature will automatically adjust the final cutoff value based on an analysis of the five previous fills, helping achieve a final target by compensating for product viscosity, changes in plant air pressures, sticky valves, etc. For each cycle, the prior five final weights are analyzed and a new pre-act value is calculated.

4.16.4 Pause Feature

The Model 350/355 I.S. can pause setpoint operations. This is useful to provide a pause for mid-cycle operator breaks, mechanical adjustments, etc.

Pause Setting	Action	Result
Disabled		Pause feature disabled.
Keypad	Model 350/355 I.S. Key Press	Current cycle paused - all setpoints deactivated.
Remote Key	Remote Key Contact Closure	Current cycle paused - all setpoints deactivated.
Both	Model 350/355 I.S. Key Press or Remote Key Contact Closure	Current cycle paused - all setpoints deactivated.

Pause Setpoints on the Model 350 I.S.

When invoked, Pause deactivates all setpoints. The display will show *Tare= ~ Abort*. Pressing [TARE] will abort the current cycle; any other keypress will resume the cycle. The Pause feature has four settings

Pause Setpoints on the Model 355 I.S.

When invoked, Pause deactivates all setpoints. Pressing the [TARE] key will pause the setpoints. The display will show *Abort ?Pause ~ Stop = Abort*. Pressing the [STOP] key again will abort the setpoints. Pressing the [START] key will resume all setpoints. In the independent setpoint mode, the setpoints will remain deactive until the [START] key is pressed.

4.17 Percentage Checkweigh

This feature is commonly used in checkweigh applications and must be enabled before attempting to use.

After a target weight is entered, upper and lower tolerances are entered as a percentage of the target. Over and under tolerance values are automatically calculated according to the percentages entered. The desired target may be based on gross weight, net weight or quantity (if counting is enabled).

Setpoint Selection	Function	Description
P5100.1	ChecP	Check-weigh by percentage
P5101.--	Targ1	Absolute target value
P5102.--	PctLo	Low acceptance percentage
P5103.--	PctHi	High acceptance percentage
P5104.0	Based	Select from Net, Gross or Quantity

4.17.1 Enter a Target Value

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed. If the target value shown is correct, press [TARE] to go to the PctLo value. To change the target value, go to step 2.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered. Refer to the example below as a reference.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE] to accept the entered value. Once the tare key is pressed, *PctLo* will be displayed. This is where the low percentage will be entered. Enter target percentage value in the same manner as the target weight was entered above. If the displayed value is correct, press [TARE].

4. Next the *PctHi* value will be displayed. This is target percentage value for the high percentage. Enter this value in the same manner as the target weight was entered above. If the displayed value is correct press [SELECT]. The display will return to the weigh mode. Press [SELECT] to view the desired weigh mode parameter.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the target weight with the numeric keys and press [ENTER].
3. The *PctLo* value will be displayed. Key the in target percentage value with the numeric keys and press [ENTER].
4. The *PctHi* value will be displayed. Key the in target percentage value with the numeric keys and press [ENTER].
5. Press [SELECT] to select the desired weigh mode parameter.

4.17.2 Start Checkweighing

The checkweigh applications do not have a start function. Simply put the item to be weighed onto the scale platter. An annunciator will illuminate to indicate whether the item is within tolerance.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Status	Annunciator Status	Annunciator Color (LED)
OVER	SP 1 Illuminated	Red
GOOD	SP 2 Illuminated	Green
UNDER	SP 3 Illuminated	Yellow

4.18 Fill

The fill program is used for single-speed or dual-speed filling operations. The dual-speed fill operation allows for both a fast and a slow fill mode. During a fast-fill, setpoints 1 (SP1) and 2 (SP2) are activated. During a slow-fill or single-speed fill, only setpoint 1 (SP1) is activated. This feature must be enabled before attempting to use. Over filling can be prevented with the use of pre-act values (PA1 and PA2). Pre-act 1 (PA1) is used for switching the fast fill to a slow fill. Pre-act 2 (PA2) is used as a final cutoff value.

Setpoint Selection	Function	Description
P5100.1	Fill	Select Fill Setpoint Operation
P5101.--	Targ1	Final Fill Target Value
P5104.0	Based	Select between Net or Quantity
P5105.--	PA 1	Pre-Act 1 Value (Fast-to-Slow Value; 0 for Single-Speed)
P5107.0	Start 1	Setpoint Activation Method
P5109.--	PA 2	Pre-Act 2 Value (Final Cutoff)
P5110.1	Learn 2	Learn Feature for Pre-Act 2
P5114.1	PrAc 1	Pre-Act 1 Available as Subset in Weigh Mode
P5115.1	PrAc 2	Pre-Act 2 Available as Subset in Weigh Mode
P5116.1	Pause	Keypad Press invokes Pause

4.18.1 Enter a Target Value

Pressing [TARE] or [ENTER] alone allows access to the subsets. PA1 and PA2 are the subsets for Targ 1.

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered. Refer to the example below.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE]. Once the tare key is pressed, it is possible that PA1 will be displayed if the pre-act parameter is enabled.

3a. If a value is desired, enter it in the same manner as the target weight was entered above. When the displayed value is correct, press [TARE].

3b. If no value is to be entered or PA1 is not displayed, press [TARE] to go to the next screen.

4. If PA2 is displayed, enter the value in the same manner as the target weight was entered above and press [TARE] to accept or press [TARE] to return to the weigh mode. Press [SELECT] to view the desired weigh mode parameter.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the desired target value with the numeric keys and press [ENTER].
3. The PA1 value will be displayed. Key the in value with the numeric keys and press [ENTER].
4. The PA2 value will be displayed. Key the in value with the numeric keys and press [ENTER].
5. Press [SELECT] to select the desired weigh mode parameter.

4.18.2 Start Fill

Activation Method

The fill begins with the selected activation method. The method is determined by the parameters in the setup mode.

The deactivation of the setpoints is automatic. The desired target may be based on net or quantity (if counting is enabled).

Activation types

- Tare key - Press the [TARE] key to start the process. A tare weight will be set and the weight will switch to net zero.
- Remote key - Press the remote key switch.
- Auto-start - The process is automatically activated. It waits for a no-motion condition and then adds the target to the current displayed weight to achieve a relative cutoff value.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Fill Status	Annunciator Status
Fast Fill	SP 1 & SP 2 Illuminated
Dribble Fill (or Single-Speed Fill)	SP 1 Illuminated
Fill Done or Pause	SP 1 & SP 2 Off

Fill Example

With a system set up to fill 55-gallon drums with motor oil, the following settings might be used to achieve an accurate final fill weight of 400 lbs.:

Parameter Setting	Actual Cutoff Value	Comments
Targ 1 = 400		Desired final weight.
Pre-act 1 = 28	400 - 28 = 372.0	Switch to dribble feed at 372.
Pre-act 2 = .5	400 - 0.5 = 399.5	Final fill valve closes at 399.5.

4.19 Batch

The standard batch program is used for batching up to three separate items. Ingredients 1 through 3 use setpoints and pre-acts 1 through 3 respectively. Ingredients are batched one at a time. Free falling product can be accounted for with the use of pre-act values (PA1 - PA3). This feature must be enabled before attempting to use.

Setpoint Selection	Function	Description
P5100.3	Batch	2 or 3 ingredient batching.
P5101.--	Targ1	Ingredient 1 target value.
P5104.0	Based	Select from net or count (quantity).
P5105.--	PA 1	Pre-act 1 value (final cutoff for ingredient 1).
P5106.1	Learn 1	Learn feature for pre-act 1 enabled.
P5107.0	Start 1	Setpoint 1 activation method.
P5108.--	Targ 2	Ingredient 2 target value.
P5109.--	PA 2	Pre-act 2 value (final cutoff for ingredient 2).
P5110.1	Learn 2	Learn feature for pre-act 2 enabled.
P5111.0	Start 2	Setpoint 2 activation method.
P5116.1	Pause	Keypad press invokes pause mode.
P5117.--	Targ 3	Ingredient 3 target value.
P5118.--	PrAc 3	Pre-act 3 value (final cutoff for ingredient 3).
P5119.1	Learn 3	Learn feature for pre-act 3 enabled.
P5120.0	Start 3	Setpoint 3 activation method.

4.19.1 Enter a Target

Pressing [TARE] or [ENTER] alone allows access to the subsets. PA1 and PA2 are the subsets for Targ 1.

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE]. Once the tare key is pressed, it is possible that PA1 will be displayed if the pre-act parameter is enabled.

3a. If a value is desired, enter it in the same manner as the target weight was entered above. When the displayed value is correct, press [TARE].

3b. If no value is to be entered or PA1 is not displayed, press [TARE] to go to the next screen.

4. Repeat steps 2 and 3 until all targets and pre-acts are entered. Press [TARE] to return to the weigh mode.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the desired target value with the numeric keys and press [ENTER].
3. The PA1 value will be displayed. Key the in value with the numeric keys and press [ENTER].
4. Repeat steps 2 and 3 for tArG2, PA2, tArG3 and PA3.
5. Press [SELECT] to select the desired weigh mode parameter.

4.19.2 Start Batch

Activation Method

The batch begins with the selected activation method. The method is determined by the parameters in the setup mode. The deactivation of the setpoints is automatic. The desired target may be based on net or quantity (if counting is enabled).

Activation types

- Tare key - Press the [TARE] key to start the process. A tare weight will be set and the weight will switch to net zero.
- Remote key - Press the remote key switch.
- Auto-start - The process is automatically activated. It waits for a no-motion condition and then adds the target to the current displayed weight to achieve a relative cutoff value.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active.

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Batch Status	Annunciator Status	Setpoint Status (Requires Setpoint Option Board)
Fill 1	SP 1 Illuminated	Relay 1 Contacts Closed, Relay 2 and 3 Contacts Open
Fill 2	SP 2 Illuminated	Relay 2 Contacts Closed, Relay 1 and3 Contacts Open
Fill 3	SP 3 Illuminated	Relay 3 Contacts Closed, Relay 1 and 2 Contacts Open

Batch Example

With a system set up a system to make a 50,000 lb batch with water (30,000 lbs.), corn syrup (15,000 lbs.) and caramel color (5,000 lbs.), ingredient 1 should start with [TARE] and subsequent ingredients should auto-start.

Parameter Setting	Actual Cutoff Value	Comments
Target 1 = 30,000		Desired water weight.
Pre-Act 1 = 100	30,000 - 100 = 29,900	Water valve closes at 29,900 lbs. Free-fall will bring weight to 30,000.
Start 1 = Tare		Start water with [TARE].
Target 2 = 15,000		Desired corn syrup weight.

Parameter Setting	Actual Cutoff Value	Comments
Pre-Act 2 = 236	15,000 - 236 = 14,764	Corn syrup valve closes at 14,764 lbs. Free-fall will bring weight to 15,000.
Start 2 = Auto	Calculated cutoff value for corn syrup is added to current displayed weight	Start corn syrup when water is done and motion has stopped.
Target 3 = 5,000		Desired caramel coloring weight.
Pre-Act 3 = 142	5,000 - 142 = 4,858	Carmel coloring valve closes at 4,858. Free-fall will bring weight to 5,000.
Start 3 = Auto	Calculated cutoff value for caramel coloring is added to current displayed weight	Start caramel coloring when corn syrup is done and motion has ceased.

4.20 Discharge

The discharge program is designed for single-speed or dual-speed dispensing of product from a larger weigh vessel. Discharge is a loss-in-weight application similar in operation to the fill program. When a discharge is initiated, the scale automatically tares and comes to a net zero weight. The appropriate setpoints are activated and material is discharged until the decreasing net weight reaches the desired target value. Free falling product can be accounted for with the use of pre-act values (PA1 - PA3). This feature must be enabled before attempting to use.

Setpoint Selection	Function	Description
P5100.1	Discharge	Select discharge setpoint operation.
P5101.--	Targ1	Final dispensed target value.
P5104.0	Based	Select between net or count (quantity)
P5105.--	PA 1	Pre-act 1 value (fast-to-slow value; 0 for single-speed).
P5107.0	Start 1	Setpoint activation method.
P5109.--	PA 2	Pre-act 2 value (final cutoff).
P5110.1	Learn 2	Learn feature for pre-act 2.
P5114.1	PrAc 1	Pre-act 1 available as subset in Weigh Mode.
P5115.1	PrAc 2	Pre-act 2 available as subset in Weigh Mode.
P5116.1	Pause	Keypress invokes pause.

4.20.1 Enter a Target

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [TARE] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE]. Once the tare key is pressed, it is possible that PA1 will be displayed if the pre-act parameter is enabled.

3a. If a value is desired, enter it in the same manner as the target weight was entered above. When the displayed value is correct, press [TARE].

3b. If no value is to be entered or PA1 is not displayed, press [TARE] to go to the next screen.

4. Repeat steps 2 and 3 until all targets and pre-acts are entered.

5. Press [TARE] to return to the weigh mode.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.

2. Key in the desired target value with the numeric keys and press [ENTER].

3. The PA1 value will be displayed. Key the in value with the numeric keys and press [ENTER].

4. Repeat steps 2 and 3 until all targets and pre-acts are entered.

5. Press [SELECT] to select the desired weigh mode parameter.

4.20.2 Pre-acts

Pre-act 1 is used for dual-speed dispensing. Pre-act 1 specifies when the system should switch from fast-discharge to slow-discharge. When using a single-speed device, pre-act 1 should be set to 0 from the Setup Mode. Pre-act 2 specifies the point where the final cutoff should occur, regardless of a single-speed or dual-speed operation.

4.20.3 Start Discharge

Activation Method

The dispensing activation is limited to [TARE] or a remote key input. The deactivation of the setpoints is automatic. The desired target may be based on net or quantity (if counting is enabled).

The discharge begins with the selected activation method. The method is determined by the parameters in the setup mode.

The deactivation of the setpoints is automatic. The desired target may be based on net or quantity (if counting is enabled).

Activation types

- Tare key - Press the [TARE] key to start the process. A tare weight will be set and the weight will switch to net zero.
- Remote key - Press the remote key switch.

Discharge Status	Annunciator Status	Setpoint Status (Requires Setpoint Option Board)
Fast Discharge	SP 1 & SP 2 Illuminated	Relay 1 and 2 Contacts Closed
Slow (or Single-Speed) Discharge	SP 1 Illuminated	Relay 1 Contacts Closed
Fill Done or Pause	SP 1 & 2 Off	Relay 1 and 2 Contacts Open

4.20.4 Discharge Example

With a system set up to dispense ball bearings from a 50,000 lb weigh-bin and the fast-feed requiring an early cutoff to slow-feed, the following settings might be used to achieve accurate dispensing of 1000 bearings:

Parameter Setting	Actual Cutoff Value	Comments
Targ 1 = 1000	0 - 1000 = (-1000)	Desired quantity (decreasing value from a net zero: enter as a positive value).
Based = Qty		Targets are compared to quantity (P170 Enabled).
PA 1 = 200	1000 - 200 = 800 0 - 800 = (-800)	Switch to slow feed at -800 bearings (decreasing value from a net zero: enter as a positive value).
Start = [TARE]		Start discharge with [TARE].
PA 2 = 15	1000 - 15 = 985 0 - 985 = (-985)	Final gate begins closing at 985 bearings. Delayed closure brings final quantity to 1000 (decreasing value from a net zero: enter as a positive value).

4.21 Fill and Discharge (Both)

The 'Fill and Discharge' program combines a fill operation with a discharge operation. This automates a single-speed vessel filling operation with a single-speed multiple dispensing function. Setpoint 1 is used for filling the vessel and Setpoint 2 is used for product discharge. Free falling product can be accounted for with the use of pre-act values (PA1 and PA2). This feature must be enabled before attempting to use.

Setpoint Selection	Function	Description
P5100.5	Both	Select both setpoint operation
P5101.--	Targ1	Vessel fill target value
P5104.0	Based	Select from Net or Count (Quantity)
P5105.--	PA 1	Pre-act 1 value for vessel fill
P5106.1	Learn 1	Learn feature for pre-act 1
P5107.0	Start 1	Setpoint 1 activation method
P5108.--	Targ 2	Vessel discharge target value
P5109.--	PA 2	Pre-act 2 value for vessel discharge
P5110.1	Learn 2	Learn feature for pre-act 2
P5111.0	Start 2	Setpoint 2 activation method
P5116.1	Pause	Keypad press invokes pause

4.21.1 Enter a Target

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE]. Once the tare key is pressed, it is possible that PA1 will be displayed if the pre-act parameter is enabled.

3a. If a value is desired, enter it in the same manner as the target weight was entered above. When the displayed value is correct, press [TARE].

3b. If no value is to be entered or PA1 is not displayed, press [TARE] to go to the next screen.

4. Repeat steps 2 and 3 until all targets and pre-acts are entered. Press [TARE] to return to the weigh mode.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the desired target value with the numeric keys and press [ENTER].
3. The PA1 value will be displayed. Key the in value with the numeric keys and press [ENTER].
4. Repeat steps 2 and 3 until all targets and pre-acts are entered.
5. Press [SELECT] to select the desired weigh mode parameter.

4.21.2 Pre-acts

Pre-act 1 is used for vessel filling. Pre-act 1 specifies the point where the final cutoff for the fill should occur. Pre-act 2 specifies the point where the final cutoff for the material discharge should occur.

Pre-act 1 controls setpoint 1. Pre-act 2 controls setpoint 2.

4.21.3 Activation Method

The fill and discharge functions begin with their selected activation methods. The deactivation of the setpoints is automatic. The desired target may be based on net or quantity (if counting is enabled).

Activation types

- Tare key - Press the [TARE] key to start the process. A tare weight will be set and the weight will switch to net zero.
- Remote key - Press the remote key switch.
- Auto-start - The process is automatically activated. It waits for a no-motion condition and then adds the target to the current displayed weight to achieve a relative cutoff value.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active.

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Status	Annunciator Status	Setpoint Status (Requires Setpoint Option Board)
Vessel Fill	SP 1 Illuminated	Relay 1 Contacts Closed
Vessel Discharge	SP 2 Illuminated	Relay 2 Contacts Closed
Fill Done or Pause	SP 1 & SP 2 Off	Relay 1 and Relay 2 Contacts Open

4.21.4 Pause

The 350/355 I.S. can pause setpoint operations. This is useful as a safety device, for mid-cycle operator breaks, mechanical adjustments, etc. This feature must be enabled before attempting to use.

When invoked, Pause deactivates all setpoints. The display will show *Tare= ~ Abort*. Pressing [TARE] will abort the current cycle; any other keypress will resume the cycle. The Pause feature has four settings:

Pause Setting	Action	Result
Keypad	350/355 I.S. Key Press	Current cycle paused - all setpoints deactivated.
Remote Key	Remote Key Contact Closure	Current cycle paused - all setpoints deactivated.
Both	350/355 I.S. Key Press or Remote Key Contact Closure	Current cycle paused - all setpoints deactivated.

4.21.5 Fill and Discharge Example

Parameter Setting	Actual Cutoff Value	Comments
Targ 1 = 2000		Desired vessel fill target.
Based = Net		Targets are compared to net weight.
PA 1 = 5	2000 - 5 = 1995	Fill valve closes at 1995 lbs.
Start 1 = R-but		Start fill with remote key closure.
Targ 2 = 45	0 - 45 = (-45)	Desired discharge target (decreasing weight from a net zero: enter as a positive value).
PA 2 = 5	45 - 5 = 40 0 - 40 = (-40)	Discharge valve closes at (-40) lbs. (decreasing weight from a net zero: enter as a positive value).

4.22 Absolute Checkweigh

This program is commonly used for check-weigh applications where the accepted tolerance will be an absolute value between and upper and lower limit.

Setpoint Selection	Function	Description
P5100.6	ChecA	Check-weigh by absolute value
P5101.--	Targ1	Absolute target value
P5102.--	Lo	Low acceptance value
P5103.--	Hi	High acceptance value
P5104.0	Based	Select from Net, Gross or Count (Quantity)

After a target weight is entered, upper and lower tolerances are entered as absolute values. The desired target may be based on gross weight, net weight, or quantity (if counting is enabled). Only the annunciators will light to indicator the setpoint status. Be sure to enter both the upper and limits. Failure to enter one of these values will cause a setpoint error. This feature must be enabled before attempting to use.

4.22.1 Enter a Target Value

Model 350 I.S.

1. Press [SELECT] until *tArGL* is displayed. The low target value will need to be entered. Go to step 2.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. Press [TARE]. Once the tare key is pressed, tArGH will be displayed. This is where the high target value will be entered. Enter this value in the same manner as the target weight was entered above. If the displayed value is correct, press [TARE]. The display will return to the gross mode.

Model 355 I.S.

1. Press [SELECT] until *tArGL* is displayed.
2. Key in the low target weight with the numeric keys and press [ENTER].
3. The tArGH value will be displayed. Key the in value with the numeric keys and press [ENTER].
4. Press [SELECT] to select the desired weigh mode parameter.

4.22.2 Start Checkweighing

The checkweigh applications do not have a start function. Simply put the item to be weighed onto the scale platter. An annunciator will illuminate to indicate whether the item is within tolerance.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active.

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Status	Annunciator Status	Annunciator Color (LED)
OVER	SP 1 Illuminated	Red
GOOD	SP 2 Illuminated	Green
UNDER	SP 3 Illuminated	Yellow

4.22.3 Absolute Checkweighing Example

With a system set up to check-weigh 50 lb. cement bags, the following settings might be used check-weigh bag from 49.5 to 51.5 lbs.:

Parameter Setting	Acceptable Values	Comments
Target = 50.00		Desired bag weight.
Low Value = 49.50	0 - 49.50 lbs.	Low acceptable range = 0 to 49.50 lbs.
Target Window	49.50 - 51.50 lbs	Good light within this range
High Value = 51.50	51.50 lbs. and above	High acceptable range = 51.50 lbs. and above

4.23 Target Deviation Checkweigh

The target deviation method uses a target value in which the upper and lower tolerances are deviated from the target. The upper and lower tolerances are fixed values. The accept window is varied by adding the high tolerance to the target and subtracting the low tolerance from the target. This feature is commonly used in check-weigh applications. The desired target may be based on gross weight, net weight or quantity (if counting is enabled). The annunciators will light on the indicator display or physical setpoints can be added. This feature must be enabled before attempting to use.

Setpoint Selection	Function	Description
P5100.8	Checb	Target Deviation Mode
P5101.--	Targ1	Target value
P5102.--	Lo	Low acceptance deviation
P5103.--	Hi	High acceptance deviation
P5104.0	Based	Select from Net, Gross or Quantity

4.23.1 Enter a Target Value

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed. The target value will need to be entered. Go to step 2.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press ý to accept the target weight as 20

3. Press [TARE]. Once the tare key is pressed, *Lo* will be displayed. This is where the lower tolerance value will be entered. Enter this value in the same manner as the target weight was entered above. If the displayed value is correct, press [TARE].
4. Press [TARE]. Once the tare key is pressed, *Hi* will be displayed. This is where the upper tolerance value will be entered. Enter this value in the same manner as the target weight was entered above. If the displayed value is correct, press [TARE]. The display will return to the gross mode.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the target weight with the numeric keys and press [ENTER].
3. The Lo value will be displayed. Key the in value with the numeric keys and press [ENTER].
4. The Hi value will be displayed. Key the in value with the numeric keys and press [ENTER].
5. Press [SELECT] to select the desired weigh mode parameter.

4.23.2 Start Checkweighing

The checkweigh applications do not have a start function. Simply put the item to be weighed onto the scale platter. An annunciator will illuminate to indicate whether the item is within tolerance.

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active.

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Status	Annunciator Status	Annunciator Color (LED)
OVER	SP 1 Illuminated	Red
GOOD	SP 2 Illuminated	Green
UNDER	SP 3 Illuminated	Yellow

4.23.3 Target Deviation Checkweighing Example

With a system set up to check-weigh ice cream containers, the following settings might be used to guarantee container weights from 1.98 to 2.04 lbs.:

Parameter Setting	Acceptable Values	Comments
Target = 10.00		Desired container weight.
Lo Value = 0.5	10.00 - 0.5 = 9.50	Low acceptable range = 9.50 to 10.00
Hi Value = 0.25	10.00 + 0.25 = 10.25	High acceptable range = 10.00 to 10.25

4.24 Batch 2

The batch 2 program is used for batching up to three separate items without using pre-act values. Ingredients 1 through 3 use setpoints 1 through 3 respectively. Ingredients are batched one at a time. The target values can only be set from the weigh mode by pressing the [SELECT] key.

After a batch is run all target values will be set back to 0. The target values will be set to 0 after accessing the setup mode or if power is cycled. If a new batch is started when all target values are set to 0 an error message *No Targ* will be displayed. This feature must be enabled before attempting to use.

4.24.1 Enter a Target

Model 350 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Press [PRINT] until the first digit of the new target is displayed. Press [UNITS] to accept the number displayed. Continue this step until the desired number is entered.

Example: Target of 20

2a. Press [PRINT] four times

DISPLAY READS> 2

2b. Press [UNITS] to accept the 2 that is displayed

DISPLAY READS> 2 .

2c. Press [PRINT] once

DISPLAY READS> 20

2d. Press [TARE] to accept the target weight as 20

DISPLAY READS> 20

3. If more than one target is enabled, press [SELECT] to advance to the next target (e.g. tArG2). Repeat steps 2 and 3 until all values are entered.

Model 355 I.S.

1. Press [SELECT] until *tArG1* is displayed.
2. Key in the target weight with the numeric keys and press [ENTER].
3. If more than one target is enabled, press [SELECT] to advance to the next target (e.g. tArG2). Repeat steps 2 and 3 until all values are entered.

4.24.2 Activation Method

The filling of each ingredient begins when one of three selectable start functions occur. Each ingredient may have its own start function. The deactivation of the setpoint is automatic. The desired targets may be based on net weight or quantity (if counting is enabled).

Annunciators

Indication on the display showing the status of a relay. If the annunciator is illuminated, the corresponding setpoint is active.

In order for the annunciators to activate, the displayed value must be at least five graduations above zero.

Status	Annunciator Status	Annunciator Color (LED)
Fill 1	SP 1 Illuminated	Relay 1 Contacts Closed, Relay 2 and 3 Contacts Open
Fill 2	SP 2 Illuminated	Relay 2 Contacts Closed, Relay 1 and 3 Contacts Open
Fill 3	SP 3 Illuminated	Relay 3 Contacts Closed, Relay 1 and 2 Contacts Open

4.24.3 Batch2 Example

With a system set up a system to make a 50,000 lb batch with water (30,000 lbs.), corn syrup (15,000 lbs.) and caramel color (5,000 lbs.), ingredient 1 should start with [TARE] and subsequent ingredients should auto-start.

Parameter Setting	Actual Cutoff Value	Comments
Target 1 = 30,000	Desired water weight.	Target 1 = 30,000
Based = Net	Targets are compared to net weight.	Based = Net
Start 1 = Tare	Start water with [TARE]	Start 1 = Tare
Target 2 = 15,000	Desired corn syrup weight.	Target 2 = 15,000
Start 2 = Auto	Start corn syrup when water is done and motion has stopped.	Start 2 = Auto
Target 3 = 5,000	Desired caramel coloring weight.	Target 3 = 5,000
Start 3 = Auto	Start caramel coloring when corn syrup is done and motion has ceased.	Start 3 = Auto

4.25 Independent Setpoint Operation

Independent Setpoints allow controlling setpoints when the gross, net or quantity (if counting is enabled) is above or below a target value. The reset (deactivation) choice of each setpoint is selectable from Tare, Remote Key, Auto, Non-latching or Absolute. See Key-In Parameters on page 50 for instructions on using front panel keys for data entry.

Setpoint Selection	Function	Description
P5100.7	Indep	Independent Setpoints.
P5121.1	Base 1	Select from Net, Gross or Count (Quantity) for setpoint 1.
P5122.0	Act 1	Activate setpoint 1 when weight is above or below.
P5123.--	Targ 1	Setpoint 1 target for weight to either rise above or fall below.
P5124.0	Stbl 1	Setpoint 1 activation stability setting.
P5125.0	Rset 1	Reset selection for setpoint 1.
P5126.--	Rtrg 1	Value for reset. *Only available if "Value" is selected for Reset 1.
P5127.1	Rstb 1	Reset 1 stability setting.
P5131.1	Base 2	Select from Net, Gross or Count (Quantity) for Setpoint 2.
P5132.0	Act 2	Activate setpoint 2 when weight is above or below.
P5133.--	Targ 2	Setpoint 2 target for weight to either rise above or fall below.
P5134.0	Stbl 2	Setpoint 2 stability setting.
P5135.0	Rset 2	Reset selection for setpoint 2.
P5136.--	Rtrg 2	Value for reset. *Only available if "Value" is selected for Reset 2.
P5137.1	Rstb 2	Reset 2 stability setting.
P5141.1	Base 3	Select from Net, Gross or Count (Quantity) for Setpoint 3.
P5142.0	Act 3	Activate setpoint 3 when weight is above or below.
P5143.--	Targ 3	Setpoint 3 target for weight to either rise above or fall below.
P5144.0	Stbl 3	Setpoint 3 stability setting.
P5145.0	Rset 3	Reset selection for setpoint 3.
P5146.--	Rtrg 3	Value for reset. *Only available if "Value" is selected for Reset 3.
P5147.1	Rstb 3	Reset 3 stability setting.

4.25.1 Setpoint Activation

Independent Setpoints can be activated when the gross weight, net weight or quantity (if counting is enabled) is above or below a target value. When an independent setpoint is set to Activate Above, the setpoint will activate when the selected mode (gross, net or quantity) is equal to or above the target. When set to Activate Below, the selected mode must actually be below the target.

A setpoint option board may be installed to allow the Model 350/355 I.S. to directly control lights, buzzers, valves or relays. Also, the setpoints can be configured to ignore or heed the stability setting (P114).

Independent Status	Annunciator Status	Setpoint Status (Requires Setpoint Option Board)
Setpoint 1 Active	SP 1 Illuminated	Relay 1 Closed
Setpoint 2 Active	SP 2 Illuminated	Relay 2 Closed
Setpoint 3 Active	SP 3 Illuminated	Relay 3 Closed

Independent Setpoint Reset (deactivation) choices:

Parameter Setting	Reset Choice	Description
P51x5.0	Tare	Setpoint deactivates with [TARE].
P51x5.1	Remote Key	Setpoint deactivates with Remote Key closure.
P51x5.2	Auto	Setpoint deactivates when weight returns to +/- 5 graduations of zero and stabilizes.
P51x5.3	Non-Latched	Setpoint deactivates when weight value is in a range opposite of the activation setting.
P51x5.4	Reset Value	Setpoint deactivates when weigh reaches a second value and stabilizes.

The Pre-Acts, Learn Mode, and Pause Feature options are not applicable to Independent Setpoint operation.

4.25.2 Changing Targets from the Weigh Mode

When Independent Setpoints are configured in the setpoint setup, Targ 1, 2 and 3 automatically become available modes for the [SELECT] key. An entry followed by [TARE] or [ENTER] changes the currently viewed target. If the reset for a setpoint is set to 'value', then pressing [TARE] or [ENTER] alone will allow access to the subset of the target. Rtrg 1, 2 and 3 are the respective subsets for Targ 1, 2 and 3.

4.25.3 Example

Setup a continuous-cycle static weighing system that fills a weigh hopper from a storage bin. The weigh hopper should stop the fill at a predetermined target, dump the product into a bag, and then restart the fill. A warning light should come on to give an operator advance notice to change the bag. The following setup might be used to achieve 1000 lb dumps:

Parameter Setting	Description
P5121.1 ~ Base 1 ~ Net	Weigh hopper dump valve based on net weight.
P5122.0 ~ Act 1 ~ HI	Hopper dump valve opens when net weight rises above target 1.
P5123.-- ~ Targ 1 ~ 1000	Target 1 value = 1000 kg.
P5124.1 ~ Stbl 1 ~ Inhib	Hopper dump valve delayed until scale is stable.
P5125.2 ~ Rset 1 ~ Auto	Dump valve auto-closes when net is within +/- 5 grads of zero and stable.
P5127.1 ~ Rstb1 ~ Inhib	Dump valve closure delayed until scale is stable.
P5131.1 ~ Base2 ~ Net	Weigh hopper fill valve based on net weight.
P5132.1 ~ Act 2 ~ Under	Fill valve opens when net weight falls below target 2.
P5133.-- ~ Targ 2 ~ =100	Target 2 value = 100 kg.
P5134.1 ~ Stbl2 ~ =Inhib	Fill valve opening delayed until scale is stable.
P5135.4 ~ Rset 2 ~ =Targ	Fill valve closes when net weight reaches reset target 2.
P5136.-- ~ Rtrg2 ~ 1000	Reset target 2 = 1000 kg.
P5137.0 ~ Rstb2 ~ Ignore	Fill valve closes regardless of stability.
P5141.1 ~ Base 3 ~ Net	Alarm light relay based on net weight.
P5142.0 ~ Act 3 ~ Above	Alarm relay activates when net weight rises above target 3.
P5143.-- ~ Targ 3 ~ =900	Target 3 = 900 kg.
P5144.0 ~ Stbl3 ~ Ignore	Alarm relay activates regardless of scale stability.
P5145.3 ~ Rset 3 ~ Non-L	Alarm relay closes when net weight falls below target 3.
P5147.0 ~ Rset3 ~ Ignore	Alarm relay closes regardless of scale stability.

4.26 Bargraph Setup (LCD)

A bargraph display is available for the ChecP, Fill, Batch, Dschg, Both and ChecA setpoint modes of operation. To enable the bargraph, refer to parameter P5011 (SPbar) in the Parameter Map section beginning on page 64. To weight each segment of the bargraph refer to parameter P5012 (bArPc) in the Parameter Map section beginning on page 64.

4.26.1 Scaling For "Bars" (Bargraph Arrows)

If the first bar turns off at the specified percentage (set at P5012) of the low limit, and the last bar turns off at the low limit, then the difference will be divided by 8 to determine the number of lbs per bar. At less than 5 grads, the entire graph is off.

Example#1: "ChecP" (refer to Figure 4.2)

- Lower Limit is set at 50lbs.
- P5012 is set for 80%
- Bar weight = 50 - 40 = 10
- 10/8 = 1.25 lbs

NOTE: Right-side bars will have the same scaling (lb per bar) as the left-side bars. They are represented as a mirror image of each other.

Bars ON	Weight Range (Lower Tolerance Limit)
9	< 40
8	40.00 to 41.25
7	41.25 to 42.50
6	42.50 to 43.75
5	43.75 to 45.00
4	45.00 to 46.25
3	46.25 to 47.50
2	47.50 to 48.75
1	48.75 to 50.00

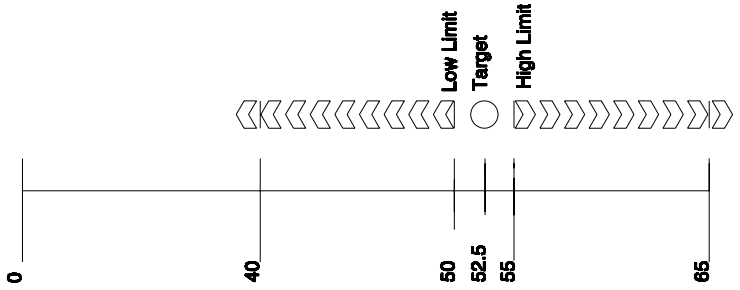


Figure 4.2 Example #1 Bargraph Segments (Weight Value)

Example#2: "ChecP" (refer to Figure 4.3)

- Lower Limit is set at 50lbs.
- P5012 is set for 20%
- Bar weight = 50 - 10 = 40
- 40/8 = 5 lbs

NOTE: Right-side bars will have the same scaling (lb per bar) as the left-side bars. They are represented as a mirror image of each other.

Bars ON	Weight Range (Lower Tolerance Limit)
9	< 10
8	10.00 to 15.00
7	15.00 to 20.00
6	20.00 to 25.00

Bars ON	Weight Range (Lower Tolerance Limit)
5	5.00 to 30.00
4	30.00 to 35.00
3	35.00 to 40.00
2	40.00 to 45.00
1	45.00 to 50.00

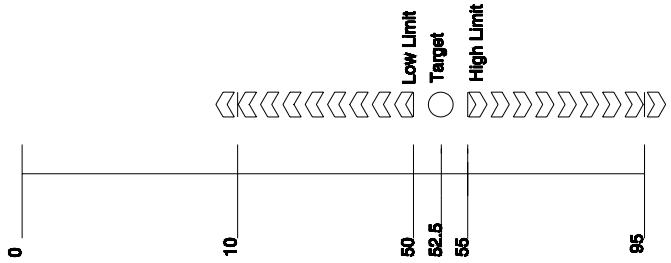


Figure 4.3 Example #2 Bargraph Segments (Weight Value)

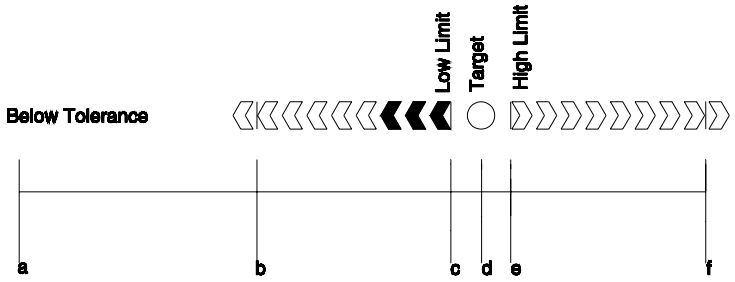


Figure 4.4 Target Below Tolerance

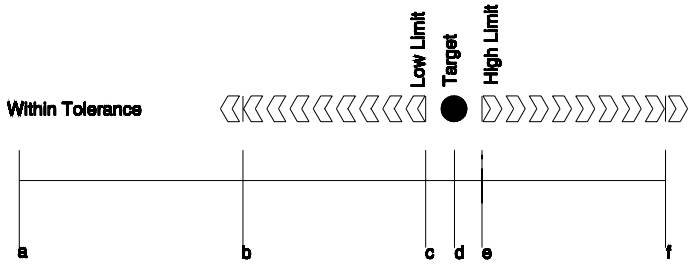


Figure 4.5 Target Within Tolerance

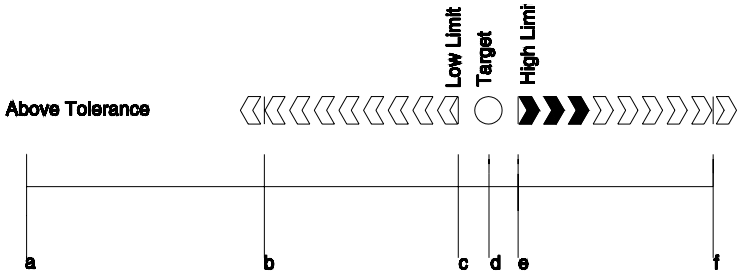


Figure 4.6 Target Above Tolerance

NOTE: (bargraph for filling and emptying modes)

For modes other than check-weighing, the bars will be on only while the setpoints are on and during the "Done" at the end of a fill.

The bar weights will be calculated similar to the check-weigh modes of operation stated above for filling, batching, etc., except that the percentage will be based on the actual target, rather than the low-limit value (see the equation below). The operation for emptying (and the emptying portion of 'both') will be the same except that the weight will be going negative while the left side bars are turning off.

Although the setpoint annunciators are not motion-inhibited, the setpoint relay outputs will not activate until a no-motion condition exists.

4.27 Analog Output Setup

Refer to the table below for parameter to setup the analog output.

Parameter Setting	Displayed Name	Description	Type/choices (*=Default)
P171.00	AnAlg	Enable analog option.	Disbl*, Enabl
P172.00	AnPar	Parameter that analog signal corresponds to. Displayed corresponds to gross while viewing the gross weight and net otherwise.	Gross*, Net, Displayed

Parameter Setting	Displayed Name	Description	Type/choices (*=Default)
P173.--	AnlFS	Full scale value at which P172 selection yields an output of 10 volts. If set to 0, uses P110 setting.	Numeric Entry:0* to ± 1,000,000
P174.--	AnOff	Offset value which yields a 0 volt output.	Numeric Entry:0* to ± 1,000,000
P175.10	AnRng	Range Value (1-10) which specifies the max value of analog output - entered in terms of voltage. NOTE: This does not change the analog span. A 0-10,000 lb. output set to 8 will stop increasing its analog signal at 8,000 lbs.	Numeric entry:0 to 10*
P176.01	AnRst	Reset state - Specifies analog signal level when Model 350 I.S. and Model 355 I.S. enters Setup Mode.	10 V (Max Output) 0 V (Min Output) No Change*
P177.00	AType	Specifies output type: voltage or current.	0 -10 volts*, 0 -20mA, 4 -20mA

The actual output signal is calculated as follows:

$$Vout = \left[\frac{\text{(P172: Parm Value) - (P174: Zero Offset)}}{\text{(P173: Full Scale Value) - (P174: Zero Offset)}} \right] X\ 10$$

If the result is greater than the Max Range Value (P175), then the analog signal is limited to the Max Range Value.

4.27.1 Analog Output Calibration

Parameter Setting	Displayed Name	Description	Type/Choices (*=default)
P61200	10oFF	Value required to precisely output 0V in 0 - 10V output mode (i.e. offset).	Numeric Entry: 0 to 15,000 (2,923*)
P61201	10Gn	Value required to precisely output 10V in 0 - 10V output mode (i.e. gain).	Numeric Entry: 50,000 to 65,535 (61,027*)
P61202	0oFF	Value required to precisely output 0 mA in 0 - 20 mA output mode (i.e. offset).	Not adjustable: (0*)
P61203	0Gn	Value required to precisely output 20 mA in 0 - 20mA output mode (i.e. gain).	Numeric Entry: 50,000 to 65,535 (54,555*)
P61204	4oFF	Value required to precisely output 0 mA in 4 - 20 mA output mode (i.e. offset).	Numeric Entry: 0 to 15,000 (10,910*)
P61205	4Gn	Value required to precisely output 20 mA in 4 - 20mA output mode (i.e. gain).	Numeric Entry: 50,000 to 65,535 (54,555*)
P61206	SrIn	Analog option board serial number.	Numeric Entry:(0*) - 4,294,967,295

An example of the printout included with each analog option kit follows below:

```
100%s23640%e        Access Setup Modes, Allowing Changes
60100%s%e           P60100.  c1998-GSE-
60101%s%e           P60101.  0Model 350  350p01009
60102%s%e           P60102.  06-30-2000
60200%s%e           P60200.  BrdSn573192
60201%s%e           P60201.  AuditTrail Euro  00001
60202%s%e           P60202.  InsSn329074
60203%s%e           P60203.  AuditTrail Cal.  00025
60204%s%e           P60204.  AuditTrail Setup 00050
61200%s2923%e       P61200.  10off   2923
61201%s61027%e      P61201.  10 Gn  61027
61202%s0%c          P61202.  0 off      0
61203%s54555%e      P61203.  0  Gn  54555
61204%s10910%e      P61204.  4 off  10910
61205%s54555%e      P61205.  4  Gn  54555
61206%s123456%e     P61206.  Srl n 123456
%z                  Exit Setup Mode
```

Analog calibration values can be entered into the Model 350 I.S. and Model 355 I.S. by keying in the data in the left-hand column, beginning at the line starting with "61200…", replacing the "%s" character pairs with the [SELECT] key and "%e" with the [TARE] (350 I.S.) or [ENTER] (355 I.S.) key. The line with the "%c" is not adjustable and cannot be entered.

You can adjust the included factory recommended offset and gain values to precisely configure the system being connected to these outputs. Once the initial factory values have been entered, pressing the [TARE] (350 I.S.) or [ENTER] (355 I.S.) key will cause the count value to increase one count, and pressing the [PRINT] + [UNITS] keys will decrement the count value by one count. All changes made are updated "live" to aid in calibrating a specific device to the analog option board output. Holding down the key(s) will repeat the increment/decrement action.

4.27.2 Analog Output Example

Analog Parameter Setting	Parameter Description	Example Value	Comments
P172.01	Net Weight	3.00 lb	Current net weight.
P173.--	Analog Full Scale	20	Net weight value that would give maximum analog output.
P174.--	Zero Offset	-40	Net weight value that would give minimum analog output.
P175.--	Max Range Value	8	Maximum analog output allowed (entered in terms of voltage).

$$Vout = \left[\frac{3 - (-40)}{20 - (-40)}\right] X\ 10 = \left[\frac{43}{60}\right] X\ 10 = 7.166$$

Since 7.166 v is less than 8 v (per P175), the output signal is not restricted and would be 7.166 v.

If a current output is selected, the output is a milli-amp current where 0 volts corresponds to either 0 mA or mA (as per P177) and 10 volts would translate to 20 mA. Values in between would be scaled proportionately:

$$Iout = \left[\frac{(20mA - 4mA) \times 7.166}{10\ V}\right] + 4mA = \left[\frac{16 \times 7.166}{10}\right] X\ 4 = 15.465mA$$

Analog signal resolution: the output is the result of a 16 bit conversion resulting in a resolution of 1 part in 65535 or 10 / 65535 = 0.00015 v.

4.28 Remote Display Configuration

The remote display function allows a master indicator (350 I.S. or 355 I.S.) to be echoed to another indicator (350 I.S., 355 I.S., 355) and be used in a remote location. There are certain parameters that must be set in order to have the master and slave indicators communicate together. Refer to the section below to configure the master and remote (slave) indicators.

The master does not transmit any information to the hub unless there is something new to report such as a change in weight, keypress, etc

4.28.1 Master to Remote (Slave) Configuration

The remote indicator will receive continuous transmission from the master indicator. It is necessary to setup the protocol parameters in both indicators so they match in order to coordinate the transmission. See table below for the common protocol parameters. A remote indicator will not show the bargraph even if it is a LCD display.

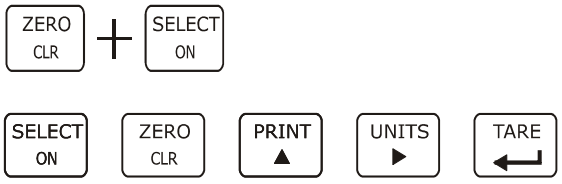
Master	Remote	Parameter Description
P200 or P220	P200 or P220	Baud rate
P201 or P221	P201 or P221	Data bits
P202 or P222	P202 or P222	Parity
P203 or P223	P203 or P223	Stop bits
P204 or P224	P204 or P224	Handshaking
P291	P274	Start Character
P292	P275	End Character

To enter the master or remote setup (local setup)

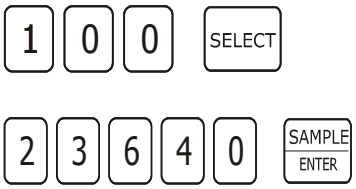
It is possible to make changes to the master indicator setup mode from either the remote indicator or the master indicator itself. The master indicator setup mode can be entered from either the master or the remote indicators. However, the remote indicator (slave) setup mode can ONLY be entered from the remote indicator. After in the setup mode, you can make changes from the remote indicator or the master indicator.

To enter the master indicator or remote indicator (local indicator) setup mode

Model 350 I.S.



Model 355 I.S.:



After the setup mode is entered, the numeric portion on the 355 I.S. keypad is restored. When in the remote (slave) setup, all annunciators are illuminated on the remote to distinguish between the master and remote (slave) indicators.

4.28.2 Setup Master Indicator

Set the following parameters on the master indicator:

- P290 - Choose the communication port of the master indicator the remote indicator is connected to.
- P291 - Transmit any ASCII character or control code to the remote indicator as a start character before echoing unit's display. Make sure this parameter matches P274 on the remote indicator.
- P292 - Transmit any ASCII character or control code to the remote indicator as an ending character after echoing unit's display. Make sure this parameter matches P275 on the remote indicator.
- P296 - Choose the remote indicator type, a 300 series or 60 series.

4.28.3 Setup Remote Indicator

For an indicator to become a remote display P260 must be set for r-dsp. There are two styles in which the remote indicator will display data received from the master indicator. These styles are display and custom. Choose one of the display styles at P271. Refer to page 112 for details on display and custom styles.

The parameters in the following table are available only when P260 is set for r-dsp or Hub.

Table 4.4 Remote Display Setup Parameters

Parameter Setting	Displayed Name	Description	Type / choices (*=Default)
P261.01	R-port	Choose the port in which the remote display (slave) will communicate with the master device.	1*, 2, None
P270.00	T-out	Determines whether the remote display (slave) will show a message when connection is lost.	Enable / Disable*
P271.00	Style	Set to display or custom. When set to display the remote will echo the display of the master indicator. When set to custom the remote receives a custom format from the master indicator. In custom mode the transmit may be send continuous or on demand.	Display* / Custom
P272.00	Addr	Set address for remote display. Only present if P271 is set for custom.	None*, 1-255
P273.01	T-use	Determines where transmits sent out the comm. port from the master or control indicator that is connected to the remote or hub are redirected to. Should not be set to the same port as P261 unless transmit wire is being used to connect to a printer connected to the remote indicator (In this case the keypad cannot be used to talk to the master or control indicator).	None*, Port 1, Port 2
P274.02	Start	Set the start character for the remote display. Choices are 0 - 255. Default value is 2 (STX). The choice must match the start character in P291 on the master display. Avoid using values of 17 or 19 when using software flow control. The values of 17 and 19 are Xon and Xoff codes and could cause conflict.	Numeric Entry: 0 to 255 2*
P275.03	End	Set the end character for the remote display. Choices are 0 - 255. Default value is 3 (ETX). The choice must match the end character in P292 on the master display. Avoid using values of 17 or 19 when using software flow control. The values of 17 and 19 are Xon and Xoff codes and could cause conflict.	Numeric Entry: 0 to 255 3*
P276.01	Rptin	Allow or disallow data received from the remote display's (slave) communication port to be sent to the master.	Enable* / Disable

Parameter Setting	Displayed Name	Description	Type / choices (*=Default)
P277.01	R-start	Enables or disables the use of the [START] key on the master indicator. When this parameter is enabled and the key is pressed, a start key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [START] key will have no effect on the master indicator.	Enable* / Disable
P278.01	R-stop	Enables or disables the use of the [STOP] key on the master indicator. When this parameter is enabled and the key is pressed, a stop key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [STOP] key will have no effect on the master indicator.	Enable* / Disable
P280.01	Zero	Enables or disables the use of the [ZERO] key on the master indicator. When this parameter is enabled and the key is pressed, a Zero key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [ZERO] key will have no effect on the master indicator.	Enable* / Disable
P281.01	Units	Enables or disables the use of the [UNITS] key on the master indicator. When this parameter is enabled and the key is pressed, a Units key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [UNITS] key will have no effect on the master indicator.	Enable* / Disable
P282.01	Select	Enables or disables the use of the [SELECT] key on the master indicator. When this parameter is enabled and the key is pressed, a Select key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [SELECT] key will have no effect on the master indicator.	Enable* / Disable
P283.01	Prtut	Enables or disables the use of the [PRINT] and [UNITS] keys on the master indicator (350 I.S.). When this parameter is enabled and the keys are pressed, the Print and Units keys will be simulated. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the keys will have no effect on the master indicator.	Enable* / Disable
P284.01	Print	Enables or disables the use of the [PRINT] key on the master indicator. When this parameter is enabled and the key is pressed, a Print key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [PRINT] key will have no effect on the master indicator.	Enable* / Disable
P285.01	Tare	Enables or disables the use of the [TARE] key on the master indicator. When this parameter is enabled and the key is pressed, a Tare key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [TARE] key will have no effect on the master indicator.	Enable* / Disable
P286.01	Enter	Enables or disables the use of the [ENTER] key on the master indicator. When this parameter is enabled and the key is pressed, an Enter/Sample key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [ENTER] key will have no effect on the master indicator.	Enable* / Disable

Parameter Setting	Displayed Name	Description	Type / choices (*=Default)
P287.01	Clear	Enables or disables the use of the [CLR] key on the master indicator. When this parameter is enabled and the key is pressed, a clear key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [CLR] key will have no effect on the master indicator.	Enable* / Disable
P288.01	Digit	Enables or disables the use of the numeric keys on the master indicator including the decimal key. When this parameter is enabled and a numeric key is pressed, it will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the numeric keys will have no effect on the master indicator.	Enable* / Disable
P289.01	Target	Enables or disables the use of the [TARGET] key on the master indicator. When this parameter is enabled and the key is pressed, a target key command will be recognized by the master indicator. The Tx, Rx and GND line must be connected between the COMM Ports of the master and remote unit. If this parameter is disabled the [TARGET] key will have no effect on the master indicator. Model 355 I.S. only.	Enable* / Disable

Display (P271)

When set for Display, information will be displayed on the remote indicator exactly as it appears on the master indicator.

Set P271 for Display and configure all other remote display parameters. Configure the parameters in the master indicator (refer to Setup Master Indicator on page 109). Make sure that the wiring connections between the master and remote indicators are correct (refer to Remote Display Connections on page 35).

Custom (P271)

When set for Custom, the master indicator will send customized information to be displayed on the remote indicator. A parameter or text data may be transmitted to the remote indicator on a continual or "on demand" basis.

Set P271 for Custom and set all other remote display parameters (refer to Table 4.4). Configure the parameters in the master indicator (refer to Setup Master Indicator on page 109). Make sure that the wiring connections between the master and remote indicators are correct (refer to Remote Display Connections on page 35. Follow the instructions below for configuring the master indicator.

1. Turn echo off at P290.
2. Set the transmit to be continuous at P210 (port 1) or P230 (port 2). This is the port going to the remote indicator.
3. Program custom transmit in the master indicator at P1000 (port 1) or P2000 (port 2). See the example below for instructions on programming a custom transmit.

If time out is enabled (P270), then the transmit should be set for continuous at P210 or P230 and have stability disabled at P212 or P232

Example:

The master indicator will be active and the Net weight will be displayed on the remote indicator. The net and lb annunciators will illuminate. The codes for the annunciators will be entered as they are control codes (see Entering ASCII Control Codes on page 69. The address of the remote indicator at P272 is 4. If P272 is set to None!, do not enter anything for the address field.

Access custom transmit 1 (P1000) or custom transmit 2 (P2000).

Format String:

If P274 and P275 = 1 - 255

<Start Character>, <Address>, <Annunciator 1>, <Annunciator 2>, <Parameter>, <End Character>

or

If P274 or P275 = 0

<Address>, <Annunciator 1>, <Annunciator 2>, <Parameter>, <Line Feed>

Custom Transmit :

1. [.002] [ENTER] or [TARE] - <Start Character>
2. [.004] [ENTER] or [TARE] - <Address>
3. [.016] [ENTER] or [TARE] - <Annunciator 1>
4. [.064] [ENTER] or [TARE] - <Annunciator 2>
5. [ENTER] or [TARE], [1], [ENTER] or [TARE], [160], [ENTER] or [TARE] - <Net Parameter>
6. [.003] [ENTER] or [TARE] - <End Character>
7. Save changes and exit the setup mode.

ASCII Code	128	64	32	16	8	4	2	0
Annunciator 1		Good2	Gross	Net	Qty	Other	kg	
Annunciator 2		lb	Spt 1	Spt 2	Spt 3	>0<	Motion	

The start character and end character can be any ASCII character 1 - 255. Refer to Table 4.5 for the annunciator codes to be entered in the custom transmit. Always use 160 for the format code when entering a parameter.

4.28.4 Hazardous Area to Safe Area Configuration

In order to use setpoints or analog output modules they must be located in the safe area. These modules will be installed in the safe area hub. Refer to Safe Area Setpoint Option Installation or Safe Area Analog Option Installation on page 44 for option installation instructions. The control indicator will be in the hazardous area and where the load cell(s) will be connected. The control and hub indicators will communicate via fiber optic cable. Refer to Fiber Optic Interface on page 38 for installation instructions.

Use the following instructions to setup the control and hub indicators. Once a control or hub indicator is chosen at P260, the protocol and interactive parameters are automatically set up. See Table 4.5 for the default parameters of the control and hub. The setpoint and analog output parameters are only set in the control indicator (refer to Setpoint Setup on page 77 or Analog Output Setup on page 101). The hub indicator will echo the control indicator.

Make sure the controller and hub are connected with the fiber-optic kit and fiber-optic cable. Setup the hub indicator first and either cycle power or enter then exit the setup mode. This will synchronize P176, P177, P61200 - P61205.

Simple Setup (Hub Indicator):

1. Set P260 for Hub.
2. Exit the setup mode.

Simple Setup (Control Indicator):

1. Set P260 for Cntrl.
2. Exit the setup mode.

Parameter	Setting	Control / Hub
P171	Ignored	hub
P220	Baud Rate - 57600	control / hub
P221	Data bits - 8 data bits	control / hub
P222	Parity - no parity	control / hub
P223	Stop bit - on stop bit	control / hub
P224	Flow control - Xon / Xoff	control / hub
P261	Receive from control or master - port 2	hub
P270	Time out - enabled	hub
P271	Echo style - display	hub
P272	Address - none	hub
P273	Transmit non displayed data - port 1	hub
P274	Start character - 2	hub
P275	End character - 3	hub
P276	Pass through to master - enabled	hub
P277	Remote start key - enabled	hub
P278	Remote stop key - enabled	hub
P280	Remote zero key - enabled	hub
P281	Remote units key - enabled	hub
P282	Remote select key - enabled	hub
P283	Remote ID key - enabled	hub
P284	Remote print key - enabled	hub
P285	Remote tare key - enabled	hub
P286	Remote enter key - enabled	hub
P287	Remote clear key - enabled	hub
P288	Remote numeric and decimal key - enabled	hub
P289	Remote target key - enabled	hub
P291	Start character - 2	control
P292	End character - 3	control
P296	Remote style - 300	control

Table 4.5 Default Control and Hub Parameters

The parameters of the hub indicator may be overridden by keying in [299] [ENTER] at P260. The parameters of the control indicator may be overridden by keying in [399] [ENTER] at P260. Refer to Table 4.5 on page 114 for the parameters available for the hub.

Each time the hub indicator is powered up, the display may show Hub. Once motion is seen, the display will echo the control unit. Setpoints and analog outputs on hub are updated within 1 second or on the actual change in state even if hub is showing.

4.28.5 300 Series Command Codes

It is possible to send commands through the serial port to perform specific tasks.

Hex	Decimal	Symbol	Percent Equivalent	Master / Remote	Action
0	0	NULL	none	M	As part of an echo used to indicate character information starting at 1st of 10 characters
1	1	SOH	none	M	As part of an echo used to indicate character information starting at 2nd of 10 characters
2	2	STX	none	M	Used to begin an echo or as part of an echo used to indicate character information starting at 3rd of 10 characters
3	3	ETX	none	M	Normally to end an echo or as part of an echo used to indicate character information starting at 4th of 10 characters
4	4	EOT	none	M	As part of an echo used to indicate character information starting at 5th of 10 characters.
5	5	ENQ	none	M	As part of an echo used to indicate character information starting at 6th of 10 characters.
6	6	ACK	none	M	As part of an echo used to indicate character information starting at 7th of 10 characters.
7	7	BEL	none	M	As part of an echo used to indicate character information starting at 8th of 10 characters.
8	8	BS	none	M	Backspace OR as part of an echo used to indicate character information starting at 9th of 10 characters.
9	9	HT	none	M	As part of an echo used to indicate character information starting at 10th of 10 characters.
A	10	LF	none	M	As part of an echo used to indicate numeric display information.
D	13	CR or CTL-M	none	M	Clear Key (clears user input or can initiate an action). As part of an echo used to indicate annunciator & display toggle scheme information.
11	17	CTL-Q	none	M/R	Xon
13	19	CTL-S	none	M/R	Xoff
81	129		%[Ctrl-A]	M	Target Key
85	133		%[Ctrl-E]	M	Start Key
86	134		%[Ctrl-F]	M	Stop Key
95	149		%[Ctrl-U]	M	Echo display (all 3 lines) out comm. 1
96	150		%[Ctrl-V]	M	Echo display (all 3 lines) out comm. 2
B9	185		%9	M	Enters the number before the %9 as the piece weight
D0	208		%P	M	Pause
D0	208		%Q	M	Send out transmits one and two
D2	210		%R	M	Remote Key 2
E0	224		%'	M	Backward Select
E3	227		%c	M	Clear Key (clears user input or can initiate an action
E5	229		%e	M	Enter Key
E9	233		%i	M	ID Key (Print & Units on 350)
EF	239		%o	M/R	Turn off 350 I.S.

Hex	Decimal	Symbol	Percent Equivalent	Master / Remote	Action
F0	240		%p	M	Print Key/ Arrow Up Key
F2	242		%r	M	Remote Key 1
F3	243		%s	M	Select Key
F4	244		%t	M	Tare Key
F5	245		%u	M	Units Key/ Right Arrow Key
F6	246		%v	M/R	Enter Setup
F8	248		%x	M	[Print][Select] Keys - Extended Resolution Gross
FA	250		%z	M	Zero Key

4.28.6 Display Capture Utility

The Display Capture Utility sends the current display information out of the one of the available comm ports when the one of the two extended ASCII character represented by decimal 149 (hex: 95h) or decimal 150 (hex: 96h) are received through the comm port. The previous characters can be used when the comm port is set to 8 data bits. For 7 data bits comm port, %[Ctrl-U] or %[Ctrl-V] can be used to replace 149 or 150 respectively. Upon receiving decimal 149, the Display Capture Utility sends the current display information out of comm port 1. Upon receiving decimal 150, the Display Capture Utility sends the current display information out of comm port 2. Entering a decimal 149 from a computer keyboard can be accomplished by turning on the Num Lock and holding down the ALT key while typing the desired decimal number on the keyboard keypad (for example, <Alt>149).

The Display Capture Utility must have NTEP (P440) disabled in order to function.

Example #1

The scale is in the weigh mode with the gross weight displayed (for example, 15.00).

Input: The extended ASCII character represented by decimal 149 (hex: 95h) is received through any comm port.

Output: "15.00 lb Gross " is sent out comm port 1.

Example #2

The scale is in setup at P110 Full Scale.

Input: The extended ASCII character represented by decimal 150 (hex: 96h) is received through any comm port.

Output: "P110 F.S. 100.00 " is sent out comm port 2.

5 Calibration

This chapter covers all methods of calibration.

5.1 Setup Mode Calibration

You can enter the Calibration Mode after accessing the Setup Mode to view and/or change parameter settings (see Setup Mode on page 47).

To access the Calibration Mode when viewing any setup parameter:

1. From the Setup Mode, press [ZERO].
2. Press [TARE] or [ENTER].

5.1.1 Fast Calibration

Fast Calibration allows calibration of the Model 350 I.S. and 355 I.S. without accessing the Setup Mode.

To access Fast Calibration from the Weigh Mode (350 I.S.):

1. From the Weigh Mode, press [ZERO] + [SELECT] simultaneously.
2. Press [ZERO] [PRINT] [UNITS] [TARE].

To access Fast Calibration from the Weigh Mode (355 I.S.):

1. From the Weigh Mode key in [1] [0] [0] [SELECT].
2. Key in [5] [4] [3] [2]]1] [ENTER]

Fast Calibration can also be accessed if the following data stream is received via the comm port:

100%s54321%e

5.2 Performing Calibration

Calibration always begins by establishing a zero (no-load) reference. A complete calibration also requires establishing a span (test load) reference. This section details various methods for obtaining zero and span references.

Press [ZERO] or [CLR] during calibration to back up one step in the procedure.

5.2.1 Establishing Zero

The Model 350/355 I.S. provides five methods for obtaining a zero (no load) calibration reference, First Zero, Last Zero, False Zero, Only Zero, and Cal Reset.

To select a calibration method (350 I.S.):

1. Press [ZERO] + [SELECT] simultaneously to display the calibration prompt.
2. Press [ZERO] [PRINT] [UNITS] [TARE] to access the Calibration Mode.
3. Press [SELECT] to scroll through the five selections.
4. Press [TARE] to establish zero.

To select a calibration method (355 I.S.):

1. Press [1] [0] [0] [SELECT] to display the calibration prompt.
2. Press [5] [4] [3] [2]]1] [ENTER] to access the Calibration Mode.
3. Press [SELECT] to scroll through the five selections.
4. Press [ENTER] to establish zero.

5.2.2 First Zero

The most common zeroing procedure, First Zero is used to establish a new zero (no load) calibration reference before proceeding to span the Model 350/355 I.S. Use this method for first-time calibration and complete recalibration.

First Zero Calibration Method (350 I.S.):

1. From the Weigh Mode, press [ZERO] + [SELECT] simultaneously
2. Press [ZERO] [PRINT] [UNITS] [TARE].
3. Remove any load on the scale.
4. Press [TARE] to establish zero.
5. Pause for motion delay.
6. Place a test weight on scale.
7. Enter the value of the test weight with the [PRINT] and [UNITS] keys.
8. Press [TARE] to establish span.
9. Pause for motion delay.
10. Press [TARE] to accept calibration.
11. Press [TARE] to save calibration.
12. Press [TARE] to exit calibration.
13. Remove calibration weight.

First Zero Calibration Method (355 I.S.):

1. From the Weigh Mode key in [1] [0] [0] [SELECT].
2. Key in [5] [4] [3] [2]]1] [ENTER].
3. Remove any load on the scale.
4. Press [ENTER] to establish zero.
5. Pause for motion delay.
6. Place a test weight on scale.
7. Enter the value of the test weight with the numeric keys.
8. Press [ENTER] to establish span.
9. Pause for motion delay.
10. Press [ENTER] to accept calibration.
11. Press [ENTER] to save calibration.
12. Press [ENTER] to exit calibration.
13. Remove the calibration weight.

5.2.3 Last Zero

The Last Zero procedure allows recalibration of the weighing device using an existing test load. This is especially beneficial when checking high capacity applications such as tank weighing to minimize the task of placing and removing test weights.

Establish gross zero before entering setup or calibration!

Last Zero Calibration with Weight Already Applied (350 I.S.):

1. Remove any load on the scale.
2. Press [ZERO] to zero the scale.
3. Apply a test weight to verify calibration.
4. Press [ZERO] + [SELECT].
5. Press [ZERO] [PRINT] [UNITS] [TARE].
6. Press [SELECT].
7. Press [TARE] to use last zero.
8. Enter the value of the test weight with the [PRINT] and [UNTIS] keys.
9. Press [TARE] to establish span.
10. Pause for motion delay.
11. Press [TARE] to accept calibration.

12. Press [TARE] to save calibration.
13. Press [TARE] to exit calibration.
14. Remove the calibration weight.

Last Zero Calibration with Weight Already Applied (355 I.S.):

1. Remove any load on the scale.
2. Press [ZERO] to zero the scale.
3. Apply a test weight to verify calibration.
4. Press [1] [0] [0] [SELECT].
5. Press [5] [4] [3] [2]]1] [ENTER].
6. Press [SELECT].
7. Press [ENTER] to use last zero.
8. Enter the value of the test weight with the numeric keys.
9. Press [ENTER] to establish span.
10. Pause for motion delay.
11. Press [ENTER] to accept calibration.
12. Press [ENTER] to save calibration.
13. Press [ENTER] to exit calibration.
14. Remove the calibration weight.

5.2.4 False Zero

False Zero calibrates the Model 350/355 I.S. without removing the current gross weight. This is particularly useful in tank weighing applications where it may be both time consuming and costly to completely empty the tank. This operation is achieved by establishing a false (temporary zero) zero reference. Test weights may then be added to verify calibration. The zero reference determined during the last calibration is not affected.

False Zero Calibration Without Removing Existing Load (350 I.S.):

1. Press [ZERO] + [SELECT].
2. Press [ZERO] [PRINT] [UNITS] [TARE].
3. Press [SELECT] [SELECT].
4. Press [TARE] to establish false (temporary) zero.
5. Pause to display calibration units.
6. Place a test weight on scale.
7. Enter the value of the test weight with the [PRINT] and [UNITS] keys.
8. Press [TARE] to establish span.

9. Pause for motion delay.
10. Press [TARE] to accept calibration.
11. Press [TARE] to save calibration.
12. Press [TARE] to exit calibration.
13. Remove the calibration weight.

False Zero Calibration Without Removing Existing Load (355 I.S.):

1. Press [1] [0] [0] [SELECT].
2. Press [5] [4] [3] [2]]1] [ENTER].
3. Press [SELECT] [SELECT].
4. Press [ENTER] to establish false (temporary) zero.
5. Pause to display calibration units.
6. Place a test weight on scale.
7. Enter the value of the test weight with the numeric keys.
8. Press [ENTER] to establish span.
9. Pause for motion delay.
10. Press [ENTER] to accept calibration.
11. Press [ENTER] to save calibration.
12. Press [ENTER] to exit calibration.
13. Remove the calibration weight.

5.2.5 Only Zero

Only Zero is used to establish a new calibration zero without affecting the span. This is useful for correcting changes to the scale's dead load, for example adding safety rails to a truck scale platform.

Only Zero Calibration (350 I.S.):

1. From the Weigh Mode, press [ZERO] + [SELECT].
2. Press [ZERO] [PRINT] [UNITS] [TARE].
3. Press [SELECT] [SELECT] [SELECT].
4. Remove any load on the scale.
5. Press [TARE] to establish zero.
6. Pause for motion delay.
7. Press [TARE] to accept calibration.
8. Press [TARE] to save calibration.
9. Press [TARE] to exit calibration.

Only Zero Calibration (355 I.S.):

1. From the Weigh Mode, press [1] [0] [0] [SELECT].
2. Press [5] [4] [3] [2]]1] [ENTER].
3. Press [SELECT] [SELECT] [SELECT].
4. Remove any load on the scale.
5. Press [ENTER] to establish zero.
6. Pause for motion delay.
7. Press [ENTER] to accept calibration.
8. Press [ENTER] to save calibration.
9. Press [ENTER] to exit calibration.

5.2.6 Reset Calibration

Cal Reset may be necessary when an over-load or under-load condition exists, preventing the completion of the calibration process. Calibration Reset adjusts the zero and gain factors of the A/D amplifier to factory default values for maximum sensitivity.

After performing a calibration reset, a complete recalibration is required. The effects of a calibration reset do not take effect until the Model 350/355 I.S. is recalibrated and calibration information has been saved.

If Code 02 (under-load) or Code 03 (over-load) is displayed during calibration, press [ZERO] or [CLR] to perform a calibration reset.

Reset Calibration Gain Factors (350 I.S.):

1. Press [ZERO] + [SELECT].
2. Press [ZERO] [PRINT] [UNITS] [TARE].
3. Remove any load on the scale.
4. Press [TARE] to establish zero.
5. Place a test weight on scale.
6. Press [ZERO].
7. Remove any load on the scale.
8. Press [TARE] to establish zero.
9. Pause for motion delay.
10. Place a test weight on scale.
11. Enter the test weight value with the [PRINT] and [UNITS] keys.
12. Press [TARE] to establish span.

13. Pause for motion delay.
14. Press [TARE] to accept calibration.
15. Press [TARE] to save calibration.
16. Press [TARE] to exit calibration.
17. Remove the calibration weight.

Reset Calibration Gain Factors (355 I.S.):

1. Press [1] [0] [0] [SELECT].
2. Press [5] [4] [3] [2]]1] [ENTER].
3. Remove any load on the scale.
4. Press [ENTER] to establish zero.
5. Place a test weight on scale.
6. Press [ZERO].
7. Remove any load on the scale.
8. Press [ENTER] to establish zero.
9. Pause for motion delay.
10. Place a test weight on scale.
11. Enter the test weight value with the numeric keys.
12. Press [ENTER] to establish span.
13. Pause for motion delay.
14. Press [ENTER] to accept calibration.
15. Press [ENTER] to save calibration.
16. Press [ENTER] to exit calibration.
17. Remove the calibration weight.

5.2.7 Multi-Point Linearization

If the load cell signal input to the indicator has good repeatability and stability, then using multi-point linearization during calibration may significantly improve the ultimate accuracy of the data displayed by the indicator. Parameter 119 (P119) enables or disables this feature. Initially, the same basic procedures as a normal calibration are used to perform a multi-point linearization. All of the prompts provided will be exactly the same as a standard calibration for each cal point up to the *Cal ~ Good?* prompt.

If items are consistantly being weighed on either the high or low end of the cell capacity, the points of calibration can be skewed to either end of the spectrum. Multi-point linearization can compensate for a cell that is non-linear. Refer to page 117 for the instructions on how to enter the calibration mode.

First Zero?

1. Remove all weight and press [TARE] or [ENTER].
2. From the Enter Load prompt key in the first calibration point and press [TARE] or [ENTER].
3. From the Add Load prompt add the weight of the first calibration point and press [TARE] or [ENTER].
4. For calibration points 2 -5; Simply add the weight which you want to use for the next calibration point, then key in the value of the applied weight and press [TARE] or [ENTER]. You may wish to add weight until the displayed weight differs from the actual applied weight and then perform the next calibration at that point.

Reset Cal

1. Press [TARE] or [ENTER].
2. From the First Zero?prompt remove all weight and press [TARE] or [ENTER].
3. From the Enter Load prompt key in the first calibration point and press [TARE] or [ENTER].
4. From the Add Load prompt add the weight of the first calibration point and press [TARE] or [ENTER].
5. For calibration points 2 -5; Simply add the weight which you want to use for the next calibration point, then key in the total applied weight and press [TARE] or [ENTER]. You may wish to add weight until the displayed weight differs from the actual applied weight and then perform the next calibration at that point.

Up to five calibration points may be established using this procedure. However if fewer calibration points are required, simply press [TARE] or [ENTER] without entering a value at the PntX prompt.

After the last point is established, the indicator will prompt with *Cal ~ Good?* Press the [TARE] or [ENTER]. key to accept the calibration or press [ZERO] or [CLR] to backup and redo the last point as described below.

If you make a mistake at any point in the linearization process, simply press the [ZERO] or [CLR] key. The indicator w backup one step in the procedure to the previous linearization point.

After the linearization has been completed, the changes must be saved by pressing [TARE] or [ENTER] at the *Enter = Save* prompt. Otherwise the previous calibration data will remain in effect.

Examining Calibration Results

If Multi-Point Linearization is enabled (P119), the ten Parameters P61130 thru P61139 show the calibration weights used and the resulting calculated factors. Otherwise the message Not Used is displayed.

Establishing a Span

Once a zero reference has been established, the Model 350/355 I.S. displays *Enter ~ Load* and awaits the entry of a span (test load) value. This value may be entered before or after the test load has been applied.

If the calibration weight value was entered before applying the test weight, *Add ~ Load* is displayed indicating that the test weight should now be applied. Apply the test weight, press [TARE] or [ENTER] and proceed to Exiting Calibration on page 125.

If it is necessary to repeat the calibration process, press [ZERO] at the *Cal ~ Good?* prompt and repeat the calibration process.

Establishing span with a 100lb test weight:

1. Place a 100lb test weight on scale.
2. Enter [1] [0] [0].
3. Press [ZERO] or [ENTER] to establish span.
4. Pause for motion delay.

When making a significant change to the previous calibration, or when the calibration weight is less than 5% of full scale capacity, *ReCal ~ ???* will be displayed instead of *Cal ~ Good?* In this event it is recommended that the calibration be performed a second time. Press [TARE] or [ENTER] to recalibrate, or press [ZERO] to skip recalibration.

5.2.8 Exiting Calibration

Once zero and span have been established, the newly acquired calibration information must be saved to non-volatile memory before it will be realized in the Weigh Mode. When saving calibration, parameters changed in the setup mode are also saved with their new selections.

To exit and save calibration information:

1. Press [TARE] or [ENTER] to accept calibration.
2. Press [TARE] or [ENTER] to save calibration.
3. Press [TARE] or [ENTER] to exit calibration.

To exit without saving calibration information:

1. Press [TARE] or [ENTER] to accept calibration.
2. Press [ZERO].
3. Press [TARE] or [ENTER].
4. Press [TARE] or [ENTER] to exit calibration.

6 Legal for Trade

The Model 350/355 I.S. default parameter setup does not ensure compliance with legal-for-trade installations as mandated by local weights and measures authorities. This chapter contains information on NTEP and OIML regulations, sealing and audit trails, and other requirements.

Since legal-for-trade requirements may vary, you must ensure that the Model 350/355 I.S. is installed in accordance with all local regulations.

6.1 NTEP Requirements

The National Type Evaluation Program (NTEP) is a widely accepted weights and measures standard in the United States, with most states abiding by some or all of the NTEP requirements. A complete list of these regulations is available in the "Handbook 44" publication distributed by the National Institute of Standards and Technology (NIST). For more information visit http://www.nist.gov.

In order to configure the Model 350/355 I.S. to comply with NTEP requirements, parameter P440-rstrc (restrict) must be enabled. This ensures the following:

- Serial data will not be received while in the Setup Mode.
- Received alpha characters will not be displayed.
- Numeric tare entries cannot be received through the serial port.
- Pressing [TARE] with a gross weight of zero (0) will not automatically switch to the net mode.
- Negative tare values are not accepted.
- Tare rounding is enforced.
- When the tare value is zero, the net mode is not selectable.

Where applicable, enabling the restrict parameter will over-ride the current setting of other parameters.

If the counting feature is enabled, NTEP requires a label on the front of the indicator stating "The counting feature is not legal for trade".

Most NTEP requirements will also apply. See the Other Requirements section for additional considerations.

6.2 OMIL Requirements

The International Organization of Legal Metrology is an inter-governmental body which harmonizes the national metrology regulations of its world wide members. A list of regulation publications may be obtained from the Bureau International de Métrologie Légale (BIML) in Paris, France.

In order to configure the Model 350 I.S. to comply with OIML requirements, parameter P410-Euro must be enabled. Doing so will ensure the following:

- An over-load condition will result when the gross weight exceeds nine graduations over the full scale capacity.
- Full scale capacity is always referenced from the last zero calibration reference, not the last zero acquired by pressing [ZERO].

6.3 Other Requirements

Several parameters must be considered on an individual basis as their configuration may vary with different applications. These parameters include, but are not limited to:

Parameter	Description	Comment
P110	Full Scale Capacity	Verify proper scale capacity.
P111	Division Size	Verify that the maximum allowable number of scale divisions are not exceeded.
P112	Zero Track	Verify required selection.
P114	Stability	Verify required selection.
P118	Zero Range	Verify required selection.
P212	Print Stability	Verify required selection.

6.4 Sealing and Audit Trails

Most legal-for-trade installations will require the Model 350/355 I.S. to be sealed. A sealed indicator cannot be accessed for setup or calibration changes without breaking a physical seal or incrementing an event counter, thus providing evidence of tampering.

The Model 350/355 I.S. has two types of sealing provisions; a physical seal and a three-event audit trail counter. Check with your local weights and measures authority to determine your requirements.

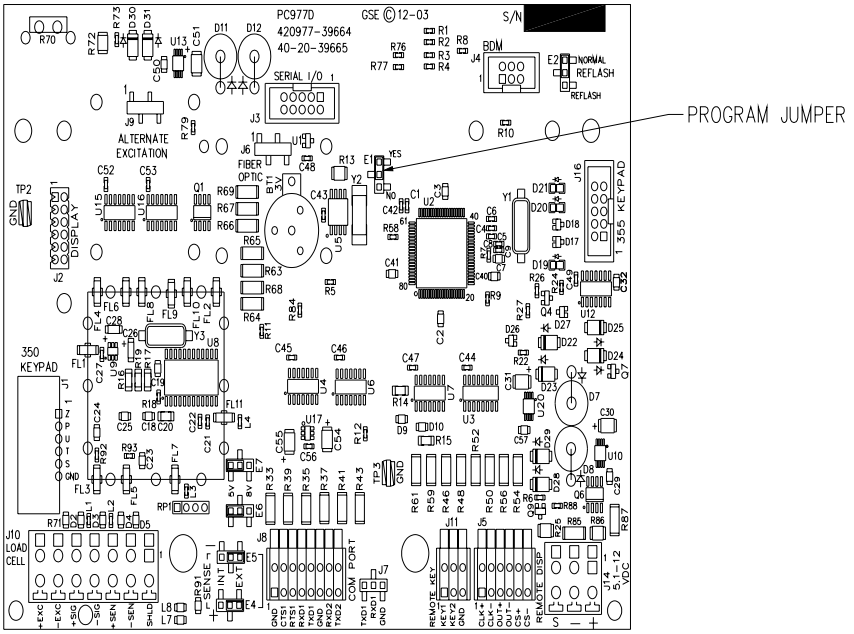


Figure 6.1 Model 350/355 I.S. Program Jumper (E1)

6.4.1 Physical Seal

The most common sealing method is a lead-wire seal. The Model 350 I.S. and Model 355 I.S. provide an easy means of applying this type of seal as shown in Figure 6.2.

Before applying a wire seal, move the program jumper to the 'NO' position as shown in Figure 6.1. This will prevent access to the Setup and Calibration Modes.

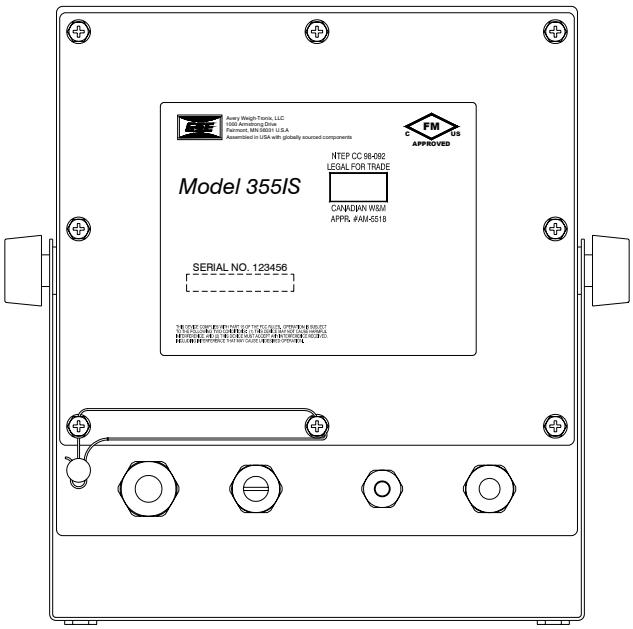


Figure 6.2 Model 350/355 I.S. Physical Seal

6.4.2 Audit Trails

Three separate incrementing, non-resetable audit trail parameters are used by the Model 350/355 I.S. to indicate changes to various parameters, P60201 - OIML, P60203 - Calibration, P60204 - Setup, and P65001 or P65002 - OIML, Calibration, and Setup. An audit trail counter will increment only once upon reflashing the indicator with new firmware, or exiting the Setup Mode and saving changes regardless of how many settings were changed.

OIML Audit Trail

Changes to any of the following parameters will increment the OIML (Euro) audit trail at P60201:

- P110 - P118 (scale setup)
- P150 (default units)
- P151 (units enable)
- P410 (Euro enable)
- P440 (rStrc enable)
- Existing Calibration
- Loading new Firmware (i.e. updates) by reflashing the indicator.

Calibration Audit Trail

Any changes to the existing calibration will increment the Calibration (CAL) audit trail at P60203.

Setup Audit Trail

Changes to any of the Setup Mode parameters will increment the setup audit trail at P60204.

Viewing Audit Trail Parameters

Audit trail parameters may be viewed at any time.

To view audit trail parameters: (Model 350 I.S.)

1. Press [ZERO] + [SELECT].
2. Press [ZERO] [PRINT] [UNITS] [TARE].
3. Enter [60203] with the [PRINT] and [UNITS] keys.
4. Press [SELECT] to view the selected audit trail.
5. Press [ZERO] to return to the Weigh Mode.

To view audit trail parameters: (Model 355 I.S.)

1. Press [1] [0] [0] [SELECT].
2. Press [6] [0] [2] [0] [3] [ENTER].
3. Press [SELECT] to view the selected audit trail.
4. Press [SELECT] to return to the Weigh Mode.

7 Troubleshooting

This chapter contains error messages and information parameters, as well as information on setup parameter selections and A/D Calibration.

7.1 Error Messages

The Model 350/355 I.S. utilizes the following types of error messages: Operational Errors, Setup Mode Errors, Hardware Errors, Calibration Errors, Communication Errors, and Miscellaneous Errors.

7.1.1 Operational Errors

Code	Description
Code02	Under Load. Input signal is less than negative full scale. Check load cell wiring. Verify correct capacity selection at P110.
Code03	Over Load. Input signal is greater than positive full scale. Use same checks as "under load" above.
Funct ~ Disbl	Attempted to perform a function disabled in the Setup Mode.
Code 04	The digits on the display have exceeded the six digit display capacity.
Code 05	Zero attempted beyond that allowed by P118.
Code 08	Input signal greatly exceeds the valid range. Check the load cell connection.
Tare ~ Error	Negative tare attempted when disabled (P440 enabled).
Tare ~ GT FS	Tare value greater than full scale capacity.
Delay	Indicates that a motion delay is in effect (zero, tare, etc.).
Delay ~ Abort	Acknowledges that a motion delayed function was aborted.
Print ~ Abort	Acknowledges that a motion delayed print request was aborted.
Add ~ Load!	If displayed after performing a count sample, this message indicates that a larger sample size is required.
Out of ~ Range	Attempted to enter a value beyond the allowable range.
SPt 4~Error	P5104 is based on quantity and the count parameter (P179) is disabled.
Need APS	A setpoint start is initiated and the setpoint is based on quantity and no piece weight has been established (start will not occur).
Edit Disbl	Unable to edit the time and date because P502 is disabled.

7.1.2 Setup Mode Errors

Code	Description
Bad ~ Code!	An incorrect access code was entered.
Unit ~ Seald	Access to the Setup or Calibration Mode was denied. Check the internal "YES/NO" program jumper.
Unit3-Ntep Code 49.	Parameter 440 (NTEP) is enabled and parameter 152 (third unit) is set to an additional unit. The third unit is not NTEP approved.
Entry ~ Error	An invalid entry was made.
Need ~ Entry	A numeric value was required before pressing [TARE].
Out of ~Range	The entered value exceeded the allowable range.
Can't ~ Set!	Attempt to change a parameter that does not allow an entry.
ResGT~ 260E3 Code 35.	The number of divisions exceeds 260000 (see P110, P111).
ResGT~ 25E3	The number of divisions exceeds 25000 (see P110, P111).
ResLT ~ 100!	The number of divisions is less than 100 (see P110, P111).
ResLT ~ 1 !!	Number of divisions is less than one (see P110, P111).
SPtxx ~ Error	A conflict occurred with a setpoint value entry (example: target entry is less than preact).The digits 'xx' represent the last two digits of the setpoint parameter in error (example: SPt 5 ~ Error indicates a conflict P5105, preact 1).
Prtcl ~ Error	Existing protocol is invalid.The following are not allowed: - P201 = 7 data bits, P202 = no parity, P203 = 1 stop bit - P201 = 8 data bits, P202 = even parity, P203 = 2 stop bits - P201 = 8 data bits, P202 = odd parity, P 203 = 2 stop bits
Reboot! ~ to chang baud	The current CPU speed at P60090 is low for the chosen baud rate.

7.1.3 Hardware Errors

Code	Description
Code00	A FRAM problem detected during power-up.
A-D ~ Bad! Or Code17	Problem with A/D chip detected. Disconnect any options installed and re-power the unit. Options are connected to the same serial lines as the A/D so they may prevent it from working properly.
Deflt ~ A-D	Bad A/D calibration values. Recalibrate A/D (see A/D Calibration Procedure on page 136).
Re- ~ Boot!	FRAM data could not be read. Attempting power-up reset.
Chec ~ E2	FRAM data error.
Deflt ~ Setup	An error occurred when reading setup data from the FRAM during power-up. All parameters are set to factory default.
Ch.XXXX	A checksum error occurred during power-up.All annunciators are lit. The FRAM integrity test failed or is improperly seated.
E2 ~ Full!	The FRAM setup exceeds the memory capacity.
E2 rd Error	Error reading EEProm. Send into Avery Weigh-Tronix
NoSpc ~ Free!	The current setup exceeds the setup RAM capacity.

7.1.4 Calibration Errors

Code	Description
F.S. ~TooHi	The entered calibration weight will result in an over-capacity condition at full scale. Verify that the full scale (P110) and calibration weight value are correct.
F.S. ~ TooLo	The entered calibration weight will result in a full scale input signal less than the minimum allowed. Verify that the full scale (P110) and entered weight value are correct.
Add ~ Load!	The calibration weight is less than 0.1% of capacity. More weight is required.
ReCal ~ ???	Repeat the cal. procedure for accuracy. This prompt appears when the calibration weight is less than 5% of capacity, or when the A/D coarse gain is adjusted.
Entry ~ Error	An invalid entry was made.

7.1.5 Communication Errors

Code	Description
Par-Er	The selected parity (P202) does not match that of the connected device.
Buf-Er	The receive buffers capacity was exceeded. This indicates a handshaking problem. Check P204 and verify proper communication port connections.
Bit-Er	The stop bit of a received character did not occur when expected. Verify that protocol (P200 - P204) matches that of the connected device.
Trans~Hold1	Data transmission is inhibited due to a deasserted handshake on communication port 1. Press [ZERO] or [CLR] to abort transmission. Check P204. If in a Control and Hub configuration, press [ZERO] or [CLR] three times to clear the error.
Trans~Hold2	Data transmission is inhibited due to a deasserted handshake on communication port 2. Press [ZERO] or [CLR] to abort transmission. Check P204. Check P204. If in a Control and Hub configuration, press [ZERO] or [CLR] three times to clear the error.
Error~BaudX	The X being either comm port 1 or comm. port 2. The baud rate selected is too high for the microprocessor rate. Either set the baud rate lower or change the microprocessor rate at P60090 higher.

7.1.6 Miscellaneous Errors

Code	Description
T.X.YYYY	If catastrophic errors occur in the software, a trap error may occur and freeze the display with address information. (X = bank number and YYYY = the address of the trap error. Press any key five seconds after viewing message to reboot the unit).

7.2 Viewing Setup Parameters

While troubleshooting it may be helpful to view the setup parameter selections. This can be done using the procedure below (even with the internal program jumper in the "NO" position). Note that accessing the Setup Mode in this manner will not permit parameter changes.

To view the setup parameter selections (350 I.S.):

1. From the Weigh Mode, press [ZERO] + [SELECT].
2. Press [TARE].
3. Navigate the Setup Mode as described in Setup Mode on page 47.

To view the setup parameter selections (355 I.S.):

1. From the Weigh Mode, press [1] [0] [0] [SELECT].
2. Press [ENTER].
3. Navigate the Setup Mode as described in Setup Mode on page 47.

To exit the Setup Mode:

1. Press [ZERO]
2. Press [ENTER]

7.3 Information Mode Parameters

A series of informational parameters are available beginning at P60000. These parameters may be accessed from the Setup Mode, or from the Weigh Mode as described below. Refer to Table 7.1 for an explanation of each information parameter.

To access the informational parameters (350 I.S.):

1. Press [ZERO] + [SELECT]
2. Press [ZERO] [PRINT] [UNITS] [TARE]
3. Navigate the Setup Mode as described in Setup Mode on page 47.

To access the informational parameters (355 I.S.):

1. Press [1] [0] [0] [SELECT]
2. Press [6] [0] [0] [0] [0] [ENTER]
3. Navigate the Setup Mode as described in Setup Mode on page 47.

As each information parameter is accessed, the parameter number is briefly displayed, followed by the parameter name, and finally the parameter value. To repeat the parameter number and name sequence, press [SELECT]. To exit the information mode, press [ZERO]

Table 7.1 Information Parameters.

Parameter	Name	Description
60000	E2Ins	Total amount of FRAM storage.
60001	E2Fre	Amount of available FRAM storage.
60090	SPEEd	Set and view the microprocessor speed. The higher the speed of the processor, the more power consumption. The default value is 3.69 MHz. Press the [TARE] key on the 350 I.S. or [ENTER] key on the 355 I.S. to change the value. The value will not take affect until power is cycled. View the current processor speed by pressing [PRINT] or [UNITS].
60100	-GSE- ~ c1998	Copyright statement.
60101	350 I.S. ~ 01001	Firmware revision code. It is likely this code will be different than shown.
60102	02- 10 ~ 1998	Firmware date code. It is likely this code will be different than shown
60200	b sn ~ 10001	Main circuit board serial number. It is likely this number will be different than shown
60201	Audit ~ Trail Euro ~ 00000	OIML (European) audit trail number (see OIML Audit Trail on page 129).
60202	i sn ~ 00000	Model 350/355 serial number. It is likely this number will be different than shown
60203	Audit ~ Trail CAL. ~ 00000	Calibration audit trail number (see Calibration Audit Trail on page 129).
60204	Audit ~ Trail Setup ~ 00000	Setup audit trail number (see Setup Audit Trail on page 129).
61100	Load ~ Cell 0.00000	Current mV/V output of the load cell.
61101	Cal ~ Factr 1.00000	Calibration factor for the load cell.
61102	Rezro ~ Load 0.00000	Amount of weight (in default units) zeroed through use of the [ZERO] key.
61103	Zrtrc ~ Load 0.00000	Amount of weight (in default units) zeroed by the zero track feature since [ZERO] was last pressed.
61104	CZero ~ 0P	Coarse zero calculated during calibration.
61105	Fine ~ Zero 1738	Fine zero calculated during calibration.
61106	CGain ~ 50	Coarse gain calculated during calibration.
61107	Fine ~ Gain 1.00000	Fine gain calculated during calibration.
61110 > 61112	Zero ~ Adj25 73741 > Zero ~ Ad100 -21813	A/D compensation for coarse zero.
61117 > 61120	AiN1 ~ NrOff -11035 > AiN8 ~ NrOff -14800	A/D non-ratio-metric offset compensation.
61121	Vre f~ NrOff -12739	A/D reference voltage compensation.
61122	Alt~E=8	Alt E=8 when the 8 volt excitation module is installed or Alt E=5 when 8 volt excitation module is not present.
61200	10oFF	Analog option 0 - 10V Zero offset value.
61201	10Gn	Analog option 0 - 10V Full scale gain value.
61202	0oFF	Analog option 0 - 20mA Zero offset value.
61203	0Gn	Analog option 0 - 20mA Full scale gain value.
61204	4oFF	Analog option 4 - 20mA Zero offset value.
61205	4Gn	Analog option 4 - 20mA Full scale gain value.
61206	SrIn	Analog option board serial number.

Parameter	Name	Description
62000	Dsply ~ Test 8.8.8.8.8.8.	Display test. Press [TARE] or [ENTER] to illuminate all segments. Continue pressing [TARE] or [ENTER] to cycle through various patterns.
62001	Spt 1 ~ Disbl	Allows setpoint status to be changed by pressing [TARE] or [ENTER] while viewing this parameter. Requires that setup was entered using the access code.
62002	Spt 2 ~ Disbl	
62003	Spt 3 ~ Disbl	
62020	AdAnl	Displays the voltage of the AC to DC power supply. Refer to P62021 if a battery in used. This parameter will still show a voltage when battery powered. This voltage reading will be slightly lower than what is display at P62021.
62021	AdbAt	Displays the voltage level on the battery when battery powered. Will show 0 if AC powered.
64000	Send ~ Setup	Transmits all setup information out the communication port.
64100	LnCnt ~ 0	Received setup line count.
64101	ErCnt ~ 0	Received setup error count.
64102	1stEr ~ None!	Parameter of the first setup receive error.
65001	Deflt ~ All	Default All. Sets all parameters to factory default settings. Press [TARE] or [ENTER] to initiate default.
65002	Deflt ~ -CAL	Same as above, except calibration is retained.
65020	Re- ~ Flash	Used for firmware upgrade. If [ENTER] is pressed at P65020, the indicator's display will blank out and appear locked up. The only way to unlock this parameter is via a computer and terminal window software (ie. Communications Plus, Hyper terminal). See Upgrade Indicator Firmware on page 75 to upgrade firmware. **To escape the firmware upgrade:** 1) Connect a computer to the serial port and use a terminal program such as CommPlus. Set the computer protocol to 9600,8,1,none. 2) Power up the indicator and the reflash menu will show in the terminal window. 3) Press the d key on the computer keyboard to quit the reflash process. 4) The indicator will return to a usable state.

7.4 A/D Calibration Procedure

The Model 350/355 I.S. Analog-to-Digital Converter (A/D) is calibrated at the factory to ensure a stable, linear response to the load cell signal. This calibration procedure calculates critical values that are permanently stored in parameters P61110 - P61121. The A/D calibration should not be confused with the standard weight calibration. It should never be necessary to recalibrate the A/D. However, if the values stored at parameters P61110 - P61121 appear to be reset to 0.00000 and/or 1.00000, then A/D recalibration is necessary. Contact Avery Weigh-Tronix or your local authorized Avery Weigh-Tronix distributor for more information on this procedure.

8 Maintenance

The mainboard, keypad and display are the key components that may need to be replaced. All service, component replacement and repairs must be performed by qualified personnel. Before opening the indicator, make sure that all power is removed and the repair is done in a safe area. If it is necessary to replace the keypad or display, you must first remove the main board. Follow the instructions below to remove and reinstall the main board.

8.1 Main Board Replacement

It is possible that the main board may need to be replaced for a number of various reasons. Please consult with a factory representative before removing the main board.

8.1.1 Main Board Removal

1. Remove the eight Phillips head screws from the back panel.
2. Separate the back panel from the front enclosure and set the back panel and screws aside. When the back panel is removed the main board will be visible.
3. Disconnect the wires for the loadcell (J10), power (J14) and communications (J8) (if used). Unplug the keypad ribbon cable from J16.
4. Remove the four lock nuts from the main board with a 7 mm nut driver.
5. Carefully remove the main board from the enclosure. If the keypad or display need to be replaced, follow the instructions for that component.

8.1.2 Main Board Installation

1. Place the main board over the studs on the enclosure. Make sure the power connector (J14) is towards the bottom of the enclosure.
2. Connect the keypad cable.
3. Fasten the main board to the enclosure with four lock nuts. Be sure not to over tighten.
4. Reinstall the back panel with two tamper proof Phillips head screws and six Phillips head screws. Be sure not to over tighten.

8.2 Keypad Replacement

If the keypad needs to be replaced due to damage or malfunction, follow the steps below to remove the inoperative keypad and replace it with a new one. The main board must be removed to access the keypad.

Model 350 I.S. Keypad Removal

1. Remove the main board. Follow the instructions for Main Board Removal.
2. Remove the four lock nuts from the keypad studs. Also remove the two plastic spacers from the keypad studs.
3. Carefully remove the keypad from the front enclosure.

Model 355 I.S Keypad Removal

1. Remove the main board. Follow the instructions for Main Board Removal.
2. There is a steel mounting plate covering the keypad. This must be removed in order to extract the keypad. Remove the four lock nuts holding on the plate with a 7 mm nut driver.
3. Carefully remove the mounting plate from the enclosure at set aside. Be sure not to remove the plastic standoffs from the plate.
4. The keypad is fastened to the enclosure by six lock nuts. Also there are four metal standoffs which provide space for the mounting plate that was removed in the previous step. Remove the four standoffs and set them aside.
5. Use a 7 mm nut driver to remove the nuts securing the keypad. The three nuts on the bottom of the keypad are not accessible with a nut driver. Use a 7 mm wrench, small adjustable wrench or 7 mm socket on a small ratchet.
6. Carefully remove the keypad from the front enclosure.

Model 350 I.S. Keypad Installation

1. Place the keypad over the keypad studs on the front enclosure.
2. Use a 7 mm nut driver to fasten the keypad to the front enclosure with four lock nuts. Also install the two plastic spacers. Refer to Figure 8.1 for lock nut and spacer positions. Be sure not to over tighten the lock nuts; 2 lb in maximum.
3. Connect the keypad cable to the main board. Reinstall main board (refer to Main Board Installation).
4. Reinstall the back panel with two tamper proof Phillips head screws and six Phillips head screws. Be sure not to over tighten.

Model 355 I.S. Keypad Installation

1. Place the keypad over the keypad studs on the front enclosure. Make sure the keypad cable connector is facing the left side of the enclosure.
2. Secure the keypad by using a 7 mm nut driver and install one lock nut on the top center keypad stud. Install one lock nut on the left side and another lock nut on the right side. Refer to Figure 8.2 for positions of lock nuts and spacers.
3. With your fingers install the remaining three lock nuts over the keypad studs on the bottom of the keypad.
4. Use a 7 mm wrench, small adjustable wrench or 7 mm socket on a small ratchet to tighten the three lock nuts. Be sure not to over tighten; 2 lb in maximum.

5. Connect the keypad cable to the main board. Reinstall main board (refer to Main Board Installation).

6. Reinstall the back panel with 2 tamper proof Phillips head screws and six Phillips head screws. Be sure not to over tighten.

8.3 Display Replacement

If the display needs to be replaced due to malfunction, follow the steps below to remove and replace the defective display. The main board must be removed in order to access the display.

8.3.1 Display Removal

1. The display is attached to the back of the main board with three plastic standoffs and a six pin header. From the component side of the main board, squeeze the plastic standoff with needle nose pliers and push the standoff through the hole on the main board. Be careful not to bend the pins of the 6 pin header.

2. Pull the display from the main board.

3. If the six pin header is in the display board, remove it and set aside. If the six pin header stayed with the main board, leave it there.

4. Remove the three plastic standoffs by squeezing the standoff with needle nose pliers and push it through the hole on the display. Side the standoffs aside.

8.3.2 Display Installation

1. Install three plastic standoffs on the new display by pushing them through the holes on the display.

2. Line up the display header with the holes on the back of the main board.

3. Gently push the header into the holes on the main board and also line up the three standoffs with the corresponding holes in the main board.

4. Place your thumbs in the middle of the display on either side and your fingers on the component side of the main board. Press the standoffs into the holes of the main board.

5. Reinstall main board (refer to section 8.1.2 , *Main Board Installation*).

6. Reinstall the back panel with two tamper proof Phillips head screws and six Phillips head screws. Be sure not to over tighten.

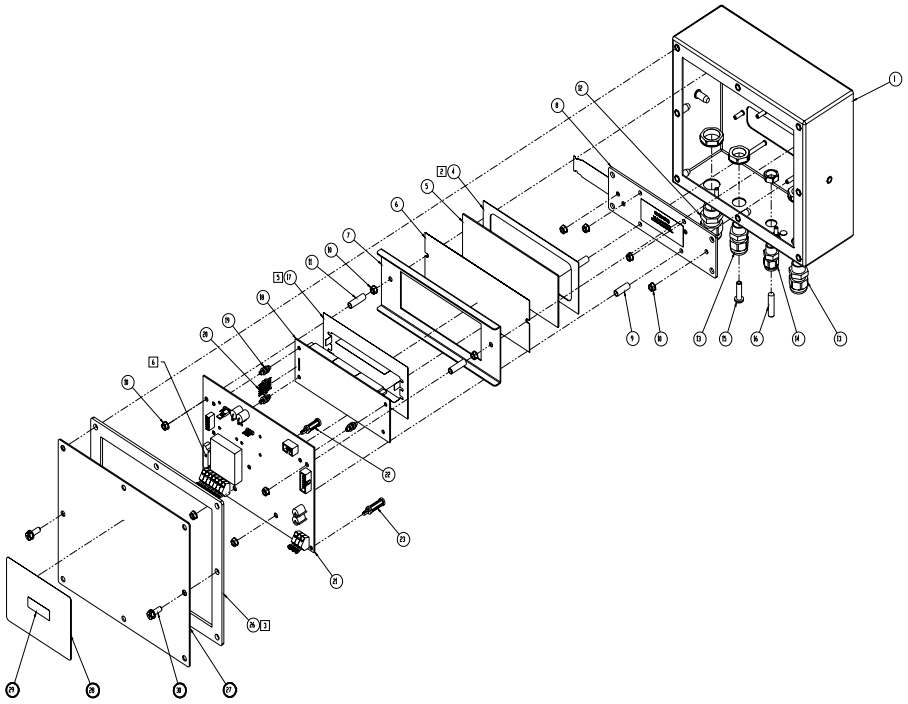


Figure 8.1 Model 350 I.S. Assembly Drawing

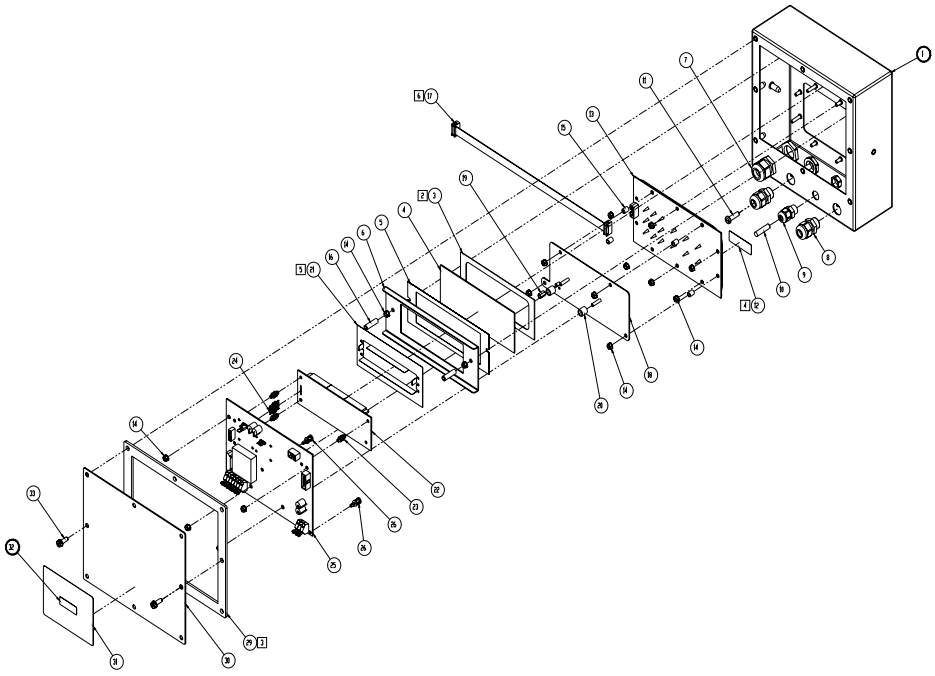


Figure 8.2 Model 355 I.S. Assembly Drawing

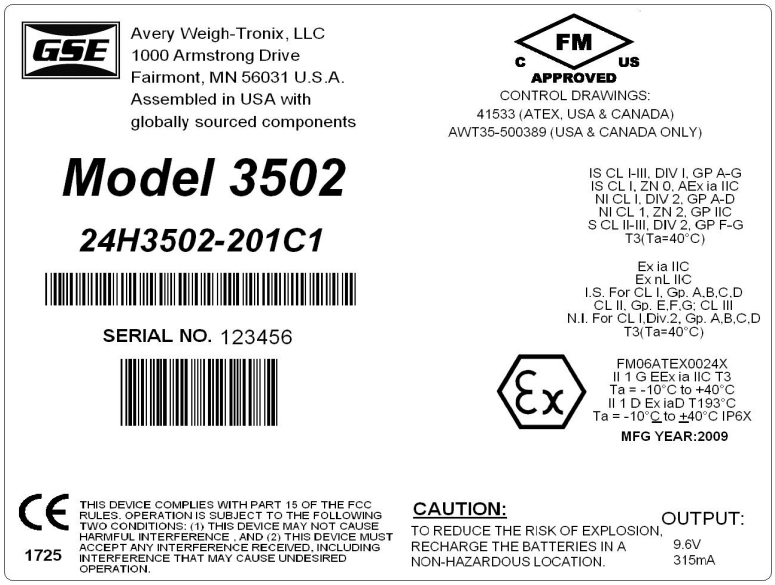
9 Label Drawings

Reference for Model 350/355 I.S. battery and AC to DC supply labels drawings.

9.1 Model 3501 AC to DC Power Supply Label

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.
Model 3501
24H3501-200C1
SERIAL NO. 123456
1725
FM
C US
APPROVED
CONTROL DRAWINGS:
41533 (ATEX, USA & CANADA)
AWT35-500389 (USA & CANADA ONLY)
Associated Apparatus
DC OUTPUTS: 12.7V, 315 mA
SINGLE OUTPUT:
AIS CL I-III.DIV 1,GP A-G
CL I.ZN 1. AEx m [ib] IIC
NI CL I.DIV 2,GP A-D
NI CL I.ZN 2,GP IIC
S CL II-III.DIV 2,GP F-G
S CL I-III.DIV 1,GP A-G*
T4(Ta = 50°C)
DUAL OUTPUTS:
AIS CL I-III.DIV 1,GP C-G
CL I.ZN 1. AEx m [ib] IIB
NI CL I.DIV 2,GP C-D
NI CL I.ZN 2,GP IIB
S CL II-III.DIV 2,GP F-G
S CL I-III.DIV 1,GP C-G*
T4(Ta = 50°C)
FM06ATEX0024X
II 2 D Ex mbD T 64°C
Ta = -10°C to + 50°C IP6X
SINGLE OUTPUT:
II 2 G EEx mb [ia] IIC T4
Ta = -10°C to + 50°C
DUAL OUTPUTS:
II 2 G EEx mb [ia] IIB T4
Ta = -10°C to + 50°C
DC OUTPUTS: 12.7V, 315 mA
SINGLE OUTPUT:
Ex ia IIC
Ex nL IIC
I.S. For CL I. Gp. A,B,C,D
CL II. Gp. E,F,G: CLIII
N.I. For CL I. Div. 2, Gp. A,B,C,D
T4(Ta = 50°C)
DUAL OUTPUTS:
Ex ia IIB
Ex nL IIC
I.S. For CL I. Gp. C,D
CL II. Gp. E,F,G: CLIII
N.I. For CL I. Div. 2, Gp. C,D
T4(Ta = 50°C)
MFG YEAR: 2009
AC INPUT:
90-250VAC
50/60Hz
120mA
WIRING CODE:
LINE = BLACK
NEUT. = WHITE
GND = GREEN
*WHEN INSTALLED IN A CL I-III. DIV 1. GP A-G LOCATION CONDUIT MUST BE USED ON THE AC SUPPLY CABLE.

9.2 Model 3502 Product Label


GSE
Avery Weigh-Tronix, LLC
1000 Armstrong Drive
Fairmont, MN 56031 U.S.A.
Assembled in USA with
globally sourced components
FM
C US
APPROVED
CONTROL DRAWINGS:
41533 (ATEX, USA & CANADA)
AWT35-500389 (USA & CANADA ONLY)
Model 3502
24H3502-201C1
SERIAL NO. 123456
IS CL I-III. DIV I. GP A-G
IS CL I. ZN 0. AEx ia IIC
NI CL I. DIV 2. GP A-D
NI CL 1. ZN 2. GP IIC
S CL II-III. DIV 2. GP F-G
T3(Ta=40°C)
Ex ia IIC
Ex nL IIC
I.S. For CL I. Gp. A,B,C,D
CL II. Gp. E,F,G; CL III
N.I. For CL I.Div.2. Gp. A,B,C,D
T3(Ta=40°C)
FM06ATEX0024X
II 1 G EEx ia IIC T3
Ta = -10°C to +40°C
II 1 D Ex iaD T193°C
Ta = -10°C to +40°C IP6X
MFG YEAR:2009
1725
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.
CAUTION:
TO REDUCE THE RISK OF EXPLOSION, RECHARGE THE BATTERIES IN A NON-HAZARDOUS LOCATION.
OUTPUT:
9.6V
315mA

9.3 350 I.S. Generic Rear Label (5 Volt Excitation)

Control Drawings: 41533 and AWT35-500389

GSE
Avery Weigh-Tronix, LLC
1000 Armstrong Drive
Fairmont, MN 56031 U.S.A.
Assembled in USA with
globally sourced components
FM
C US
APPROVED
CONTROL DRAWINGS:
41533 (ATEX, USA & CANADA)
AWT35-500389 (USA & CANADA ONLY)
Model 350IS
NTEP CC 98-092
LEGAL FOR TRADE
IS CL I-III, DIV I, GP A-G
IS CL I, ZN 0, AEx ia IIC
NI CL I, DIV 2, GP A-D
NI CL 1, ZN 2, GP IIC
S CL II-III, DIV 2, GP F-G
T4(Ta=50°C)
PLACE PART #
BARCODE HERE
CANADIAN W&M
APPR. # AM-5257
Ex ia IIC
Ex nL IIC
I.S. For CL I, Gp. A,B,C,D
CL II, Gp. E,F,G; CL III
N.I. For CL I,Div 2, Gp. A,B,C,D
T4(Ta=50°C)
SERIAL NO. 131358
FM06ATEX0024X
II 1 G EEx ia IIC T4
Ta = -10°C to +50°C
II 1 D Ex iaD 117°C
Ta = -10°C to +50°C IP6X
MFG YEAR: 2009
CE
1725
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO
CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT
ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE
THAT MAY CAUSE UNDESIRED OPERATION.
WARNING!
SUBSTITUTION OF COMPONENTS MAY IMPAIR
INTRINSIC SAFETY. TO PREVENT IGNITION OF
FLAMMABLE OR COMBUSTABLE ATMOSPHERES
DISCONNECT POWER BEFORE SERVICING.

9.4 350 I.S. Generic Rear Label (8 Volt Excitation)

Control Drawing: 41533

GSE
Avery Weigh-Tronix, LLC
1000 Armstrong Drive
Fairmont, MN 56031 U.S.A.
Assembled in USA with globally sourced components
FM
C US
APPROVED
NTEP CC 98-092
CONTROL DRAWING #41533
LEGAL FOR TRADE
IS CL I DIV I, GP C-G
IS CL I, ZN 0, AEx ia IIB
NI CL I, DIV 2, GP C-D
NI CL 1, ZN 2, GP IIB
S CL II-III, DIV 2, GP F-G
T4(Ta=50°C)
Model 350IS
CANADIAN W&M
APPR. #AM-5257
PLACE PART #
BARCODE HERE
Ex ia IIB
Ex nL IIC
I.S. For CL I, Gp. C,D
CL II, Gp. E,F,G; CL III
N.I. For CL I,Div 2, Gp. C,D
T4(Ta=50°C)
SERIAL NO. 123456
FM06ATEX0024X
II 1 G EEx ia IIB T4
Ta = -10°C to +50°C
II 1 D Ex iaD T117°C
Ta = -10°C to +50°C IP6X
MFG YEAR: 2009
CE
1725
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO
CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT
ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE
THAT MAY CAUSE UNDESIRED OPERATION.
WARNING!
SUBSTITUTION OF COMPONENTS MAY IMPAIR
INTRINSIC SAFETY. TO PREVENT IGNITION OF
FLAMMABLE OR COMBUSTIBLE ATMOSPHERES,
DISCONNECT POWER BEFORE SERVICING.

9.5 355 I.S. Generic Rear Label (5 Volt Excitation)

Control Drawings: 41533 and AWT35-500389

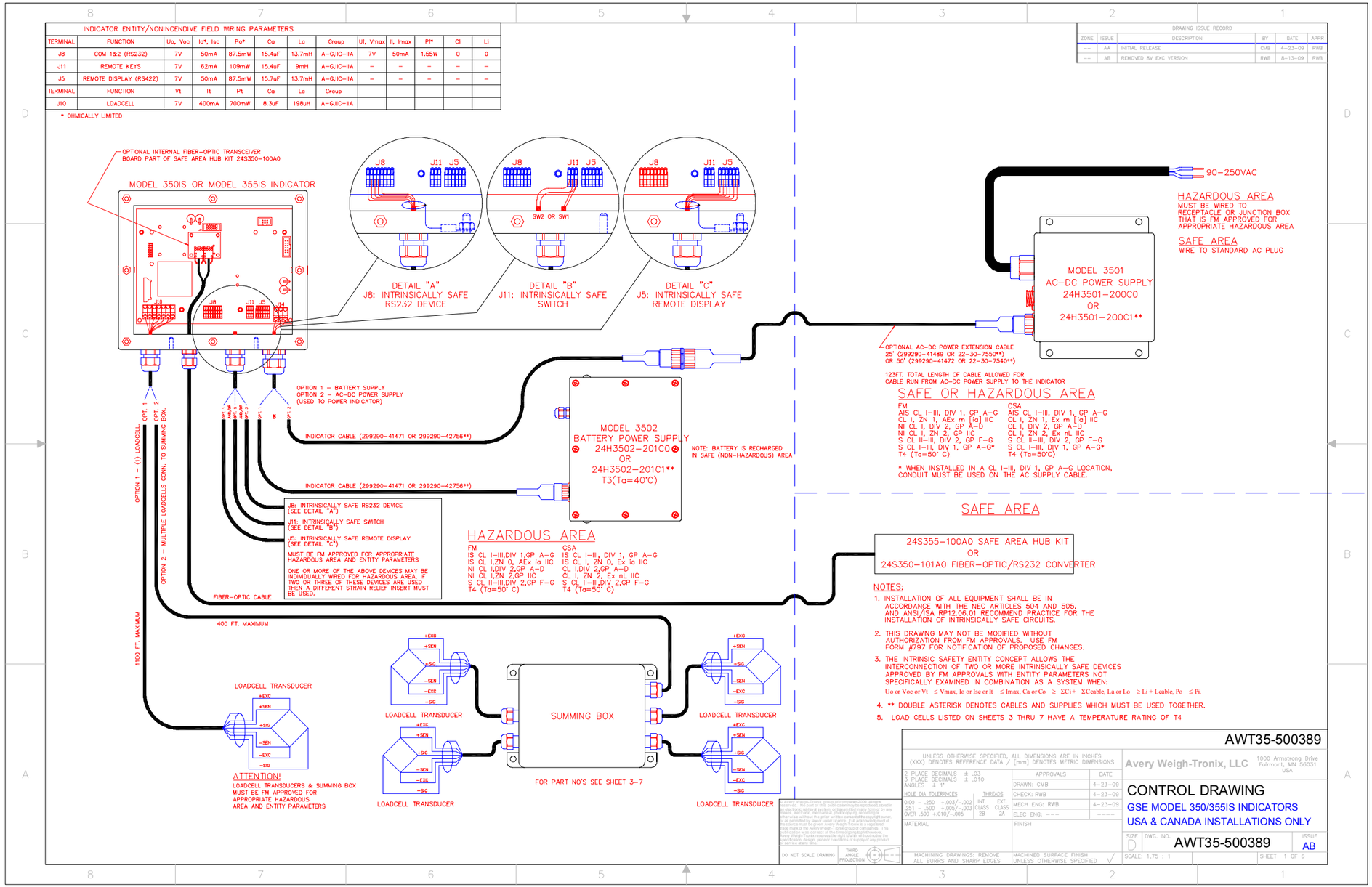
Avery Weigh-Tronix, LLC
1000 Armstrong Drive
Fairmont, MN 56031 U.S.A.
Assembled in USA with
globally sourced components
FM
C US
APPROVED
CONTROL DRAWINGS:
41533 (ATEX, USA & CANADA)
AWT35-500389 (USA & CANADA ONLY)
Model 355IS
NTEP CC 98-092
LEGAL FOR TRADE
IS CL I-III, DIV I, GP A-G
IS CL I, ZN 0, AEx ia IIC
NI CL I, DIV 2, GP A-D
NI CL 1, ZN 2, GP IIC
S CL II-III, DIV 2, GP F-G
T4(Ta=50°C)
PLACE PART #
BARCODE HERE
CANADIAN W&M
APPR. # AM-5518
Ex ia IIC
Ex nL IIC
I.S. For CL I, Gp. A,B,C,D
CL II, Gp. E,F,G; CL III
N.I. For CL I,Div 2, Gp. A,B,C,D
T4(Ta=50°C)
SERIAL NO. 123456
FM06ATEX0024X
II 1 G EEx ia IIC T4
Ta = -10°C to +50°C
II 1 D Ex iaD 117°C
Ta = -10°C to +50°C IP6X
MFG YEAR: 2009
1725
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO
CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT
ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE
THAT MAY CAUSE UNDESIRED OPERATION.
WARNING!
SUBSTITUTION OF COMPONENTS MAY IMPAIR
INTRINSIC SAFETY. TO PREVENT IGNITION OF
FLAMMABLE OR COMBUSTIBLE ATMOSPHERES,
DISCONNECT POWER BEFORE SERVICING.

9.6 355 I.S. Generic Rear Label (8 Volt Excitation)

Control Drawing: 41533

Avery Weigh-Tronix, LLC
1000 Armstrong Drive
Fairmont, MN 56031 U.S.A.
Assembled in USA with globally sourced components
FM
C US
APPROVED
NTEP CC 98-092
CONTROL DRAWING #41533
LEGAL FOR TRADE
Model 355IS
IS CL I DIV I, GP C-G
IS CL I, ZN 0, AEx ia IIB
NI CL I, DIV 2, GP C-D
NI CL 1, ZN 2, GP IIB
S CL II-III, DIV 2, GP F-G
T4(Ta=50°C)
CANADIAN W&M
APPR. # AM-5518
PLACE PART #
BARCODE HERE
Ex ia IIB
Ex nL IIC
I.S. For CL I, Gp. C,D
CL II, Gp. E,F,G; CL III
N.I. For CL I,Div 2, Gp. C,D
T4(Ta=50°C)
SERIAL NO. 123456
FM06ATEX0024X
II 1 G EEx ia IIB T4
Ta = -10°C to +50°C
II 1 D Ex iaD T117°C
Ta = -10°C to +50°C IP6X
MFG YEAR: 2009
1725
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO
CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE , AND (2) THIS DEVICE MUST ACCEPT
ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE
THAT MAY CAUSE UNDESIRED OPERATION.
WARNING!
SUBSTITUTION OF COMPONENTS MAY IMPAIR
INTRINSIC SAFETY. TO PREVENT IGNITION OF
FLAMMABLE OR COMBUSTIBLE ATMOSPHERES,
DISCONNECT POWER BEFORE SERVICING.

Appendix A: Model 350 I.S. and Model 355 I.S. Control Drawings


INDICATOR ENTITY/NONINCENDIVE FIELD WIRING PARAMETERS
TERMINAL | FUNCTION | Uo, Voc | Io*, Isc | Po* | Ca | La | Group | Ui, Vmax | Ii, Imax | Pi* | Ci | Li
J8 | COM 1&2 (RS232) | 7V | 50mA | 87.5mW | 15.4uF | 13.7mH | A-G,IIC-IIA | 7V | 50mA | 1.55W | 0 | 0
J11 | REMOTE KEYS | 7V | 62mA | 109mW | 15.4uF | 9mH | A-G,IIC-IIA | – | – | – | – | –
J5 | REMOTE DISPLAY (RS422) | 7V | 50mA | 87.5mW | 15.7uF | 13.7mH | A-G,IIC-IIA | – | – | – | – | –
TERMINAL | FUNCTION | Vt | It | Pt | Ca | La | Group
J10 | LOADCELL | 7V | 400mA | 700mW | 8.3uF | 198uH | A-G,IIC-IIA
* OHMICALLY LIMITED
DRAWING ISSUE RECORD
ZONE | ISSUE | DESCRIPTION | BY | DATE | APPR
--- | AA | INITIAL RELEASE | CMB | 4-23-09 | RWB
--- | AB | REMOVED 8V EXC VERSION | RWB | 8-13-09 | RWB
OPTIONAL INTERNAL FIBER-OPTIC TRANSCEIVER BOARD PART OF SAFE AREA HUB KIT 24S350-100A0
MODEL 350IS OR MODEL 355IS INDICATOR
DETAIL "A" J8: INTRINSICALLY SAFE RS232 DEVICE
DETAIL "B" J11: INTRINSICALLY SAFE SWITCH
DETAIL "C" J5: INTRINSICALLY SAFE REMOTE DISPLAY
SW2 OR SW1
90-250VAC
HAZARDOUS AREA
MUST BE WIRED TO RECEPTACLE OR JUNCTION BOX THAT IS FM APPROVED FOR APPROPRIATE HAZARDOUS AREA
SAFE AREA
WIRE TO STANDARD AC PLUG
MODEL 3501
AC-DC POWER SUPPLY
24H3501-200C0
OR
24H3501-200C1**
OPTIONAL AC-DC POWER EXTENSION CABLE
25' (299290-41489 OR 22-30-7550**)
OR 50' (299290-41472 OR 22-30-7540**)
123FT. TOTAL LENGTH OF CABLE ALLOWED FOR CABLE RUN FROM AC-DC POWER SUPPLY TO THE INDICATOR
SAFE OR HAZARDOUS AREA
FM
AIS CL I-III, DIV 1, GP A-G
CL I, ZN 1, AEx m [ia] IIC
NI CL I, DIV 2, GP A-D
NI CL I, ZN 2, GP IIC
S CL II-III, DIV 2, GP F-G
S CL I-III, DIV 1, GP A-G*
T4 (Ta=50° C)
CSA
AIS CL I-III, DIV 1, GP A-G
CL I, ZN 1, Ex m [ia] IIC
CL I, DIV 2, GP A-D
CL I, ZN 2, Ex nL IIC
S CL II-III, DIV 2, GP F-G
S CL I-III, DIV 1, GP A-G*
T4 (Ta=50°C)
* WHEN INSTALLED IN A CL I-III, DIV 1, GP A-G LOCATION, CONDUIT MUST BE USED ON THE AC SUPPLY CABLE.
OPTION 1 – BATTERY SUPPLY
OPTION 2 – AC-DC POWER SUPPLY (USED TO POWER INDICATOR)
INDICATOR CABLE (299290-41471 OR 299290-42756**)
MODEL 3502
BATTERY POWER SUPPLY
24H3502-201C0
OR
24H3502-201C1**
T3(Ta=40°C)
NOTE: BATTERY IS RECHARGED IN SAFE (NON-HAZARDOUS) AREA
INDICATOR CABLE (299290-41471 OR 299290-42756**)
J8: INTRINSICALLY SAFE RS232 DEVICE (SEE DETAIL "A")
J11: INTRINSICALLY SAFE SWITCH (SEE DETAIL "B")
J5: INTRINSICALLY SAFE REMOTE DISPLAY (SEE DETAIL "C")
MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
ONE OR MORE OF THE ABOVE DEVICES MAY BE INDIVIDUALLY WIRED FOR HAZARDOUS AREA. IF TWO OR THREE OF THESE DEVICES ARE USED THEN A DIFFERENT STRAIN RELIEF INSERT MUST BE USED.
HAZARDOUS AREA
FM
IS CL I-III,DIV 1,GP A-G
IS CL I,ZN 0, AEx ia IIC
NI CL I,DIV 2,GP A-D
NI CL I,ZN 2,GP IIC
S CL II-III,DIV 2,GP F-G
T4 (Ta=50° C)
CSA
IS CL I-III, DIV 1, GP A-G
IS CL I, ZN 0, Ex ia IIC
CL I,DIV 2,GP A-D
CL I, ZN 2, Ex nL IIC
S CL II-III,DIV 2,GP F-G
T4 (Ta=50° C)
OPTION 1 – (1) LOADCELL
OPTION 2 – MULTIPLE LOADCELLS CONN. TO SUMMING BOX
1100 FT. MAXIMUM
FIBER-OPTIC CABLE
400 FT. MAXIMUM
SAFE AREA
24S355-100A0 SAFE AREA HUB KIT
OR
24S350-101A0 FIBER-OPTIC/RS232 CONVERTER
NOTES:
1. INSTALLATION OF ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH THE NEC ARTICLES 504 AND 505, AND ANSI/ISA RP12.06.01 RECOMMEND PRACTICE FOR THE INSTALLATION OF INTRINSICALLY SAFE CIRCUITS.
2. THIS DRAWING MAY NOT BE MODIFIED WITHOUT AUTHORIZATION FROM FM APPROVALS. USE FM FORM #797 FOR NOTIFICATION OF PROPOSED CHANGES.
3. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO OR MORE INTRINSICALLY SAFE DEVICES APPROVED BY FM APPROVALS WITH ENTITY PARAMETERS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN:
Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or Co ≥ ΣCi + ΣCcable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
4. ** DOUBLE ASTERISK DENOTES CABLES AND SUPPLIES WHICH MUST BE USED TOGETHER.
5. LOAD CELLS LISTED ON SHEETS 3 THRU 7 HAVE A TEMPERATURE RATING OF T4
LOADCELL TRANSDUCER
+EXC
+SEN
+SIG
-SEN
-EXC
-SIG
SUMMING BOX
FOR PART NO'S SEE SHEET 3-7
ATTENTION!
LOADCELL TRANSDUCERS & SUMMING BOX MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
AWT35-500389
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES (XXX) DENOTES REFERENCE DATA / [mm] DENOTES METRIC DIMENSIONS
2 PLACE DECIMALS ± .03
3 PLACE DECIMALS ± .010
ANGLES ± 1°
HOLE DIA TOLERANCES
0.00 - .250 +.003/-.002
.251 - .500 +.005/-.003
OVER .500 +.010/-.005
THREADS INT CLASS 2B EXT CLASS 2A
MATERIAL
FINISH
APPROVALS | DATE
DRAWN: CMB | 4-23-09
CHECK: RWB | 4-23-09
MECH ENG: RWB | 4-23-09
ELEC ENG: --- | ---
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
MACHINING DRAWINGS: REMOVE ALL BURRS AND SHARP EDGES
MACHINED SURFACE FINISH UNLESS OTHERWISE SPECIFIED
Avery Weigh-Tronix, LLC
1000 Armstrong Drive Fairmont, MN 56031 USA
CONTROL DRAWING
GSE MODEL 350/355IS INDICATORS
USA & CANADA INSTALLATIONS ONLY
SIZE D
DWG. NO: AWT35-500389
ISSUE AB
SCALE: 1.75 : 1
SHEET 1 OF 6

BENCH SCALE/ DECK SCALE WEIGH BARS
RECTANGULAR GUIDED BEAM TYPE

PART NUMBER	DESCRIPTION
23133-XXXX	50, 100 LB CAPACITY CONVEYOR W/B, 5 PIN CONNECTOR
21383-XXXX *	30 THUR 500 LB CAPACITY; 7 PIN CONNECTOR
21330-XXXX	30 THRU 500 LB CAPACITY; SPADE LUGS OR TINNED LEADS
21944-XXXX	500, 1000 LB CAPACITY; 7 PIN CONNECTOR

DECK SCALE WEIGH BARS
ROUND, SINGLE ENDED

PART NUMBER	DESCRIPTION
16441-XXXX	125 LB CAPACITY, .50 DIA, 5 PIN CONNECTOR
19176-XXXX	125 LB CAP, .50 DIA, SPADE LUG TERMINALS
14700-XXXX	250 LB CAP, .62 DIA, 5 PIN CONNECTOR
19177-XXXX	250 LB CAP, .62 DIA, SPADE LUG TERMINALS
23816-XXXX	250 LB CAP, .62 DIA, 5 PIN, WASH DOWN
49400-XXXX	250 LB CAP, .81 DIA, TINNED LEADS
14701-XXXX	500 LB CAP, .81 DIA, 5 PIN CONNECTOR
19178-XXXX	500 LB CAP, .81 DIA, SPADE LUG TERMINALS
23827-XXXX	500 LB CAP, .81 DIA, 5 PIN CONNECTOR, WASH DOWN
27836-XXXX	500 LB CAP, .81 DIA, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR
45364-XXXX	500 LB CAP, .81 DIA, LOW PROFILE DECK TYPE, TINNED LEADS
48303-XXXX	500 LB CAP, .81 DIA, TINNED LEADS
14702-XXXX	1250 LB CAP, 1.25 DIA, 5 PIN CONNECTOR
19179-XXXX	1250 LB CAP, 1.25 DIA, SPADE LUG TERMINALS
23832-XXXX	1250 LB CAP, 1.25 DIA, 5 PIN CONNECTOR, WASH DOWN
27795-XXXX	1250 LB CAP, 1.25 DIA, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR
28153-XXXX	1250 LB CAP, 1.25 DIA, LOW PROFILE DECK TYPE, 5 PIN CONN, WASH DOWN
29884-XXXX	1250 LB CAP, 1.25 DIA, LOW PROFILE DECK TYPE, 5 PIN, EPOXY PAINT
49860-XXXX	1250 LB CAP, 1.25 DIA, UNTINNED LEADS
14703-XXXX	2500 LB CAP, 1.62 DIA, 5 PIN CONNECTOR
19180-XXXX	2500 LB CAP, 1.62 DIA, SPADE LUG TERMINALS
23850-XXXX	2500 LB CAP, 1.62 DIA, 5 PIN CONNECTOR, WASH DOWN
27977-XXXX	2500 LB CAP, 1.62 DIA, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR
28154-XXXX	2500 LB CAP, 1.62 DIA, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR, WASH DOWN
49619-XXXX	2500 LB CAP, 1.62 DIA, UNTINNED LEADS
13498-XXXX	5000 LB CAP, 2.00 DIA, 5 PIN CONNECTOR
17257-XXXX	5000 LB CAP, 2.00 DIA, SPADE LUG TERMINALS
23852-XXXX	5000 LB CAP, 2.00 DIA, 5 PIN CONNECTOR, WASH DOWN
28074-XXXX	5000 LB CAP, 2.00 DIA, CONNECTOR OR LEADS
13851-XXXX	10,000 LB CAP, 2.50 DIA, 5 PIN CONNECTOR
17255-XXXX	10,000 LB CAP, 2.50 DIA, SPADE LUG TERMINALS
28293-XXXX	10,000 LB CAP, 2.50 DIA, 5 PIN CONNECTOR, WASH DOWN
16456-XXXX	20,000 LB CAP, 3.25 DIA, 5 PIN CONNECTOR
17256-XXXX	20,000 LB CAP, 3.25 DIA, SPADE LUG TERMINALS
41035-XXXX	WBL - 1.25 K, EPOXY PAINT W/MODIFIABLE CABLE
41036-XXXX	WBL - 2.50 K, EPOXY PAINT W/MODIFIABLE CABLE
41037-XXXX	WBL - 5.00 K, EPOXY PAINT W/MODIFIABLE CABLE

* XXXX DENOTES THE LAST FOUR DIGITS OF THE PART NUMBER WHICH, FOR EACH DRAWING, DESIGNATE VARIATIONS IN CABLE LENGTHS, CAPACITIES, TYPE, OR NTEP VS NON-NTEP MODELS.

TRUCK SCALE WEIGH BARS

PART NUMBER	DESCRIPTION
18824-XXXX	PITLESS MOTOR TRUCK SCALE, 37.5K LB CAPACITY, 5 PIN CONNECTOR
17604-XXXX	PITLESS MOTOR TRUCK SCALE, 37.5K LB CAPACITY, SPADE LUG TERMINALS
27173-XXXX	PITLESS MOTOR TRUCK SCALE, 50K LB CAPACITY, 5 PIN CONNECTOR
20799-XXXX	PITLESS MOTOR TRUCK SCALE, 75K LB CAPACITY, 5 PIN CONNECTOR
24203-XXXX	PITLESS MOTOR TRUCK SCALE, 75K LB CAPACITY, SPADE LUG TERMINALS
14031-XXXX	PIT TYPE MOTOR TRUCK SCALE; 33K, 37.5K, AND 40K CAPACITY; SPADE LUG TERMINALS
20455-XXXX	PIT TYPE MOTOR TRUCK SCALE; 50K AND 75K LB CAP; SPADE LUG TERMINALS
50104-XXXX	WBT - 50.0 K BRIDGEMONT
50935-XXXX	WBT - 60.0 K BRIDGEMONT
55829-XXXX	EASI POST BARS

CONVERSION KIT WEIGH BARS
LEVER TO ELECTRONIC TYPE TRUCK SCALE

PART NUMBER	DESCRIPTION
18583-XXXX	CONVERSION KIT, "S" TYPE; 250, 500, AND 1000 LB CAPACITIES
22256-XXXX	CONVERSION KIT, "S" TYPE; 2500 LB CAPACITY
13434-XXXX	CONVERSION KIT, SINGLE ENDED; 250, 375, 500, 667, 1000 LB CAPACITY
13863-XXXX	CONVERSION KIT, SINGLE ENDED; 500, 1587, 2000, 2500 LB CAPACITY

MONORAIL WEIGH BARS

PART NUMBER	DESCRIPTION
17142-XXXX	MONORAIL; 1000, 2000, 5000 LB CAPACITY

NOTICE !
CHANGES TO THIS DRAWING REQUIRE DOCUMENT CONTROL PRE-APPROVAL FROM FM APPROVALS

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SCALE 1:1 | SHEET 2 OF 6

FOREIGN DECK WEIGH BARS

PART NUMBER	DESCRIPTION
29291-XXXX	500 LB CAPACITY, DECK TYPE
29292-XXXX	500 LB CAPACITY, LOW PROFILE DECK TYPE
29293-XXXX	1250 LB CAPACITY, DECK TYPE
29294-XXXX	1250 LB CAPACITY, LOW PROFILE DECK TYPE
29295-XXXX	2500 LB CAPACITY, DECK TYPE
29296-XXXX	2500 LB CAPACITY, LOW PROFILE DECK TYPE
29864-XXXX	5000 LB CAPACITY, DECK TYPE
29865-XXXX	10,000 LB CAPACITY, DECK TYPE
47812-XXXX	500 LB CAPACITY, 2 mV/V
47811-XXXX	500 LB CAPACITY WBP, 5 PIN CONNECTOR, 2 mV/V
51732-XXXX	1250 LB CAPACITY WBL, 5 PIN CONNECTOR
52250-XXXX	5000 LB CAPACITY WBL, 5 TINNED LEADS

STAINLESS STEEL WEIGH BARS

PART NUMBER	DESCRIPTION
46457-XXXX	50 LB CAPACITY, SINGLE POINT
47716-XXXX	250 LB CAPACITY, 5 PIN CONNECTOR
47717-XXXX	250 LB CAPACITY, SPADE LUG TERMINALS
27730-XXXX	500 LB CAPACITY, DECK TYPE, 5 PIN CONNECTOR
27960-XXXX	500 LB CAPACITY, DECK TYPE, SPADE LUG TERMINALS
45374-XXXX	500 LB CAPACITY, LOW PROFILE DECK TYPE, TINNED LEADS
45838-XXXX	500 LB CAPACITY, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR
47866-XXXX	500 LB CAPACITY, 5 PIN CONNECTOR
47869-XXXX	500 LB CAPACITY, 5 PIN CONNECTOR
27732-XXXX	1250 LB CAPACITY, DECK TYPE, 5 PIN CONNECTOR
27962-XXXX	1250 LB CAPACITY, DECK TYPE, SPADE LUG TERMINALS
45943-XXXX	1250 LB CAPACITY, LOW PROFILE DECK TYPE, 5 PIN CONNECTOR
47825-XXXX	1250 LB CAPACITY, 5 PIN CONNECTOR
47870-XXXX	1250 LB CAPACITY, 5 PIN CONNECTOR
46391-XXXX	2500 LB CAPACITY, DSL TYPE, 5 PIN CONNECTOR
27733-XXXX	2500 LB CAPACITY, DECK TYPE, 5 PIN CONNECTOR
27963-XXXX	2500 LB CAPACITY, DECK TYPE, SPADE LUG TERMINALS
47867-XXXX	2500 LB CAPACITY, 5 PIN CONNECTOR
47871-XXXX	2500 LB CAPACITY, 5 PIN CONNECTOR
27731-XXXX	5000 LB CAPACITY, DECK TYPE, 5 PIN CONNECTOR
27961-XXXX	5000 LB CAPACITY, DECK TYPE, SPADE LUG TERMINALS
47868-XXXX	5000 LB CAPACITY, 5 PIN CONNECTOR
47872-XXXX	5000 LB CAPACITY, 5 PIN CONNECTOR
46134-XXXX	10K LB CAPACITY, DS TYPE, 5 PIN CONNECTOR
46135-XXXX	10K LB CAPACITY, DS TYPE, SPADE LUG TERMINALS
48103-XXXX	10K LB CAPACITY, SPADE LUG TERMINALS
48262-XXXX	10K LB CAPACITY, 5 PIN CONNECTOR
48120-XXXX	20K LB CAPACITY, SPADE LUG TERMINALS
48126-XXXX	20K LB CAPACITY, 5 PIN CONNECTOR
52241-XXXX	WBLW MODEL, TINNED LEADS
51203-XXXX	WBLS - 250 LB, 5 PIN CONNECTOR

BOLTDOWN BATCHING WEIGH BARS

PART NUMBER	DESCRIPTION
50661-XXXX	WBP - .125 K BOLTDOWN TINNED LEADS
50662-XXXX	WBP - .250 K BOLTDOWN TINNED LEADS
50663-XXXX	WBP - .500 K BOLTDOWN TINNED LEADS
50664-XXXX	WBP - 1.25 K BOLTDOWN TINNED LEADS
50665-XXXX	WBP - 2.50 K BOLTDOWN TINNED LEADS
50666-XXXX	WBP - 5.00 K BOLTDOWN TINNED LEADS
50667-XXXX	WBP - 10.0 K BOLTDOWN TINNED LEADS

BATCHING WEIGH BARS DOUBLE ENDED

PART NUMBER	DESCRIPTION
18265-XXXX	250, 500 LB CAPACITY, 5 PIN CONNECTOR
18304-XXXX	250, 500 LB CAPACITY, SPADE LUG TERMINALS
18303-XXXX	1000, 1250 LB CAPACITY, 5 PIN CONNECTOR
18397-XXXX	1000, 1250 LB CAPACITY, SPADE LUG TERMINALS
21087-XXXX	2000 LB CAPACITY, STATIONARY FEED MIXER
18324-XXXX	2000, 2500 LB CAPACITY, 5 PIN CONNECTOR
18543-XXXX	2000, 2500 LB CAPACITY, SPADE LUG TERMINALS
18352-XXXX	5000 LB CAPACITY, 5 PIN CONNECTOR
18546-XXXX	5000 LB CAPACITY, SPADE LUG TERMINALS
13939-XXXX	5K, 10K, 12.5K, 20K, 25K CAPACITY, 5 PIN CONNECTOR
17201-XXXX	5K, 10K, 12.5K, 20K, 25K CAPACITY, SPADE LUG TERMINALS
18602-XXXX	50K, 75K, 100K, 150K, 200K CAPACITY, SPADE LUG TERMINALS

STAINLESS STEEL BENCH/ DECK SCALE WEIGH BARS, MODEL FLS RECTANGULAR GUIDED BEAM

PART NUMBER	DESCRIPTION
49098-XXXX	45-500 LB CAPACITY, SPADE LUGS OR TINNED LEADS
49099-XXXX	45-500 LB CAPACITY, 7 PIN CONNECTOR
49100-XXXX	625-1250 LB CAPACITY, 7 PIN CONNECTOR

NOTICE !
CHANGES TO THIS DRAWING REQUIRE DOCUMENT CONTROL PRE-APPROVAL FROM FM APPROVALS

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WEIGH BAR JUNCTION BOX ASSEMBLIES WITH CONNECTORS

PART NUMBER	DESCRIPTION
13625-XXXX	2 WEIGH BARS
14164-XXXX	3 WEIGH BARS
13197-XXXX	4 WEIGH BARS
27837-XXXX	4 WEIGH BARS, DSL
19219-XXXX	4 WEIGH BARS, LTS
24274-XXXX	4 WEIGH BARS/SUMMING
49548-XXXX	2 WEIGH BARS, SIGNAL SPAN
49549-XXXX	3 WEIGH BARS, SIGNAL SPAN
49550-XXXX	4 WEIGH BARS, SIGNAL SPAN
49551-XXXX	4 WEIGH BARS, SIGNAL SPAN, DSL

WEIGH BAR JUNCTION BOX ASSEMBLIES FOR SPADE TERMINALS

PART NUMBER	DESCRIPTION
13646-XXXX	1 WEIGH BAR, CONVERSION KIT
14122-XXXX	1 WEIGH BAR, CONVERSION KIT
17575-XXXX	3 WEIGH BARS
13949-XXXX	4 WEIGH BARS
49650-XXXX	4 WEIGH BARS, SIGNAL SPAN
17576-XXXX	6 WEIGH BARS
14278-XXXX	8 WEIGH BARS
18510-XXXX	10 WEIGH BARS

SCALE SUMMING/SELECTOR JUNCTION BOXES

PART NUMBER	DESCRIPTION
13690-XXXX	TWO PLATFORM SUMMING
13308-XXXX	A,B, OR BOTH SELECTOR
14242-XXXX	A OR B SELECTOR
29337-XXXX	4 POSITION SELECTOR
56121-XXXX	J-BOX, 4-LOAD CELL
56122-XXXX	J-BOX, 6-LOAD CELL

WEIGH-TRONIX WEIGH BARS AND TRANSDUCERS LIFT TRUCK SCALE TRANSDUCERS

PART NUMBER	DESCRIPTION
19221-XXXX	LTS TRANSDUCERS, CLASS II AND III
48304-XXXX	LTSC TRANSDUCERS, LTT-2.5K
50468-XXXX	LTSC TRANSDUCERS, LTT-6.0K

DSB SERIES DECK WEIGH BARS

PART NUMBER	DESCRIPTION
46001-XXXX	1250 LB CAPACITY
45808-XXXX	1250 LB CAPACITY, NON-SEALABLE
45814-XXXX	2500 LB CAPACITY
46020-XXXX	2500 LB CAPACITY, NON-SEALABLE
46807-XXXX	MODEL WBB-5K, NTEP

PRINTED CIRCUIT BOARDS FOR WEIGH BAR JUNCTION BOXES

PART NUMBER	DESCRIPTION
29920-XXXX	PC BD ASSY, FOR DRUM WEIGHER
45960-XXXX	PC BD ASSY, FOR DSB
49731-XXXX	PC BD ASSY, JUNCTION BOX
50068-XXXX	PC BD ASSY, SCALE SUMMING
28731-XXXX	PC BD ASSY, JUNCTION BOX
55913-XXXX	PC BD ASSY, JUNCTION BOX

CRANE SCALE LOAD CELLS

PART NUMBER	DESCRIPTION
47984-XXXX	1, 2, 5, 10 & 20 METRIC TONNE CAP

NOTICE !
CHANGES TO THIS DRAWING REQUIRE DOCUMENT CONTROL PRE-APPROVAL FROM FM APPROVALS

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SCALE 1:1 | SHEET 4 OF 6

NTEP STAINLESS STEEL WEIGH BARS

PART NUMBER	DESCRIPTION
46771-XXXX	MODEL WBLS-500, W/CONNECTOR
46772-XXXX	MODEL WBLS-500, SPADE LUGS
46773-XXXX	MODEL WBLS-500, TINNED LEADS
46774-XXXX	MODEL WBLS-1.25K, W/CONNECTOR
46775-XXXX	MODEL WBLS-1.25K, SPADE LUGS
46776-XXXX	MODEL WBLS-1.25K, TINNED LEADS
46777-XXXX	MODEL WBLS-2.5K, W/CONNECTOR
46778-XXXX	MODEL WBLS-2.5K, SPADE LUGS
46779-XXXX	MODEL WBLS-2.5K, TINNED LEADS
46780-XXXX	MODEL WBLS-5K, W/CONNECTOR
46781-XXXX	MODEL WBLS-5K, SPADE LUGS
46782-XXXX	MODEL WBLS-5K, TINNED LEADS
46783-XXXX	MODEL WBPS-500, W/CONNECTOR
46784-XXXX	MODEL WBPS-500, SPADE LUGS
46785-XXXX	MODEL WBPS-500, TINNED LEADS
46786-XXXX	MODEL WBPS-1.25K, W/CONNECTOR
46787-XXXX	MODEL WBPS-1.25K, SPADE LUGS
46788-XXXX	MODEL WBPS-1.25K, TINNED LEADS
46789-XXXX	MODEL WBPS-2.5K, W/CONNECTOR
46790-XXXX	MODEL WBPS-2.5K, SPADE LUGS
46791-XXXX	MODEL WBPS-2.5K, TINNED LEADS
46792-XXXX	MODEL WBPS-5K, W/CONNECTOR
46793-XXXX	MODEL WBPS-5K, SPADE LUGS
46794-XXXX	MODEL WBPS-5K, TINNED LEADS
53363-XXXX	MODEL WBLS-500, TINNED LEADS, 2mV/V

SENSORTRONICS SUMMING BOX

SUMMING BOX MODEL: 20034 SERIES

SPECIAL APPLICATIONS WEIGH BARS

PART NUMBER	DESCRIPTION
47072-XXXX	LIFTER SCALE, SMART WAY II

WEIGH-TRONIX / DILLON LOAD CELLS

PART NUMBER	DESCRIPTION
31909-XXXX	MODEL SGMT TENSION LOAD CELL, 2000 LB
31910-XXXX	MODEL SGMT TENSION LOAD CELL, 10000 LB
31911-XXXX	MODEL SGMT TENSION LOAD CELL, 20000/40000 LB
31912-XXXX	MODEL SGMT TENSION LOAD CELL, 50000 LB
31913-XXXX	MODEL SGMC COMPRESSION LOAD CELL, 2000 LB
31914-XXXX	MODEL SGMC COMPRESSION LOAD CELL, 10000 LB
31915-XXXX	MODEL SGMC COMPRESSION LOAD CELL, 20000/40000 LB
31916-XXXX	MODEL SGMC COMPRESSION LOAD CELL, 50000 LB
33365-XXXX	MODEL Z COMPRESSION LOAD CELL, 25 TO 1000 LB
33565-XXXX	MODEL Z TENSION LOAD CELL, 25 TO 1000 LB

HERMETICALLY SEALED WEIGH BARS

PART NUMBER	DESCRIPTION
57607-XXXX	HSWB ASSEMBLY, 1250 LB DSL TYPE
57608-XXXX	HSWB ASSEMBLY, 2500 LB DSL TYPE
57609-XXXX	HSWB ASSEMBLY, 5000 LB DSL TYPE

NOTICE !
CHANGES TO THIS DRAWING
REQUIRE DOCUMENT CONTROL
PRE-APPROVAL FROM
FM APPROVALS

SIZE D | DWG. NO. AWT35-500389 | ISSUE AB
SCALE 1:1 | SHEET 5 OF 6

WEIGH-TRONIX / SANTA ROSA LOAD CELLS

PART NUMBER		DESCRIPTION
8153-00035	7153-01624	MK 3 PDS LOAD CELL, 25 LB
	7153-01635	MK 3 PDS LOAD CELL, 15 LB
8153-00009	7153-01605	MK 3A LOAD CELL, 2 LB, 1 FT, CONNECTOR
8153-00033	7153-01606	MK 3A LOAD CELL, 5 LB
	7153-01607	MK 3A LOAD CELL, 10 LB
	7153-01608	MK 3A LOAD CELL, 25 LB
	7153-01609	MK 3A LOAD CELL, 50 LB
	7153-01610	MK 3A LOAD CELL, 100 LB
8153-04693	7153-04698	MK 3E LOAD CELL, 7 KG, 3500D
	7153-04761	MK 3E LOAD CELL, 7 KG, 5000D
	7153-07390	MK 3E LOAD CELL, 15 KG, 5000D
	7153-04712	MK 3E LOAD CELL, 15 KG, 3000D
	7153-04760	MK 3E LOAD CELL, 15 KG, 5000D
	7153-04715	MK 3E LOAD CELL, 25 KG, 5000D
	7153-05666	MK 3E LOAD CELL, 15 KG, 5000D, RND CBL
	7153-05665	MK 3E LOAD CELL, 25 KG, 5000D, RND CBL
	7153-05664	MK 3E LOAD CELL, 7 KG, 5000D, RND CBL
	7153-07338	MK 3E LOAD CELL, 10 KG, 5000D
	7153-10322	MK 3E LOAD CELL, 10 KG, UNSEALED
	7153-04831	MK 3E LOAD CELL, 7 KG, UNSEALED
	7153-04832	MK 3E LOAD CELL, 15 KG, UNSEALED
	7153-04833	MK 3E LOAD CELL, 25 KG, UNSEALED
	7153-08665	MK 3E LOAD CELL, 12 KG, UNSEALED
7153-08212	7153-08212	MK 3E LOAD CELL, 1 KG, UNSEALED
7153-08213	7153-08213	MK 3E LOAD CELL, 3 KG, UNSEALED
7153-08663	7153-08663	MK 3E LOAD CELL, 5 KG, UNSEALED
8153-00048	7153-01687	MK 4D LOAD CELL, 15 LB, W/RES, 14 FT
8153-00030	7153-01587	MK 5 LOAD CELL, 50 LB, 26 FT
	7153-01588	MK 5 LOAD CELL, 100 LB, 26 FT
	7153-01589	MK 5 LOAD CELL, 200 LB, 26 FT
	7153-01590	MK 5 LOAD CELL, 500 LB, 26 FT
8153-00031	7153-01602	MK 15 LOAD CELL, 1000 LB
8153-04942	7153-03827	MK 16 LOAD CELL, 35 KG, 5000, P.B.
	7153-04927	MK 16 LOAD CELL, 9 KG, 3000D
	7153-04930	MK 16 LOAD CELL, 15 KG, 3000D
	7153-04936	MK 16 LOAD CELL, 50 KG, 2000D
	7153-04937	MK 16 LOAD CELL, 50 KG, 2500D
	7153-04938	MK 16 LOAD CELL, 50 KG, 5000D
	7153-04952	MK 16 LOAD CELL, 50 KG, UNSEALED
	7153-05658	MK 16 LOAD CELL, 35 KG, 5000D
	7153-05659	MK 16 LOAD CELL, 50 KG, 5000D, RND CBL
	7153-07389	MK 16 LOAD CELL, 50 KG, 5000D
	7153-09443	MK 16 LOAD CELL, 50 KG, HAWK PB
	7153-12678	MK 16 LOAD CELL, 15 KG, 3000D
	7153-12809	MK 16 LOAD CELL, 75 KG, 3000D
8153-09871	7153-09439	MK 17 LOAD CELL, 50 KG, UNSEALED
	7153-09887	MK 17 LOAD CELL, 125 KG, UNSEALED
	7153-10022	MK 17 LOAD CELL, 50 KG, 2500D
	7153-10024	MK 17 LOAD CELL, 125 KG, 2500D
	7153-10216	MK 17 LOAD CELL, 50 KG, 5000D
	7153-10217	MK 17 LOAD CELL, 125 KG, 5000D
	7153-12463	MK 17 LOAD CELL, 50 KG, 3200D
	7153-12464	MK 17 LOAD CELL, 75 KG, 3000D
	7153-14853	MK 17 LOAD CELL, 75 KG, 3000D
8153-13568	7153-13110	MK 17 LOAD CELL, 125 KG, 5000D
	7153-13569	MK 17 LOAD CELL, 125 KG, UNSEALED
	7153-13573	MK 17 LOAD CELL, 125 KG, 2500D

WEIGH-TRONIX / SANTA ROSA LOAD CELLS

PART NUMBER		DESCRIPTION
8153-09435	7153-09436	MK 17B LOAD CELL, 5 KG, UNSEALED
	7153-09437	MK 17B LOAD CELL, 12 KG, UNSEALED
	7153-09438	MK 17B LOAD CELL, 25 KG, UNSEALED
	7153-10018	MK 17B LOAD CELL, 5 KG, 2500D
	7153-10020	MK 17B LOAD CELL, 12 KG, 2500D
	7153-10021	MK 17B LOAD CELL, 25 KG, 2500D
	7153-10213	MK 17B LOAD CELL, 5 KG, 5000D
	7153-10214	MK 17B LOAD CELL, 12 KG, 5000D
	7153-10215	MK 17B LOAD CELL, 25 KG, 5000D
	7153-11048	MK 17B LOAD CELL, 18 KG, PC-800
	7153-11699	MK 17B LOAD CELL, 50 KG, PC-800
	7153-11817	MK 17B LOAD CELL, 5 KG, PC-800
8153-14502	7153-14496	MK 18 LOAD CELL, 50 KG, 5000D
	7153-14498	MK 18 LOAD CELL, 160 KG, 3000D
	7153-14499	MK 18 LOAD CELL, 75 KG, 5000D
	7153-14501	MK 18 LOAD CELL, 115 KG, 5000D
8153-02743	7153-05853	MK 19 LOAD CELL, 250 LB, 2000D, OLD CONN.
	7153-05967	MK 19 LOAD CELL, 250 LB, 5000D, OLD CONN.
	7153-08670	MK 19 LOAD CELL, 250 LB, 4000D
8153-08346	7153-09396	MK 21 LOAD CELL, 7.5 KG, UNSEALED, 10 FT
	7153-09398	MK 21 LOAD CELL, 35 KG, UNSEALED, 10 FT
	7153-09399	MK 21 LOAD CELL, 18 KG, UNSEALED, 10 FT
	7153-09556	MK 21 LOAD CELL, 35 KG, UNSEALED
	7153-10952	MK 21 LOAD CELL, 35 KG, SEALED, CANADIAN
	7153-10932	MK 21 LOAD CELL, 7.5 KG, SEALED, CANADIAN
	7153-10115	MK 21 LOAD CELL, 7.5 KG, SEALED
	7153-10116	MK 21 LOAD CELL, 18 KG, SEALED
	7153-10117	MK 21 LOAD CELL, 35 KG, SEALED
	7153-10434	MK 21 LOAD CELL, 7.5 KG, SEALED, HBM
	7153-10435	MK 21 LOAD CELL, 35 KG, SEALED, HBM
	7153-12633	MK 21 LOAD CELL, 7.5 KG, UNSEALED
	7153-12635	MK 21 LOAD CELL, 35 KG, UNSEALED
	7153-12636	MK 21 LOAD CELL, 18 KG, UNSEALED
	7153-12637	MK 21 LOAD CELL, 35 KG, UNSEALED
	7153-12638	MK 21 LOAD CELL, 18 KG, UNSEALED
	7153-12639	MK 21 LOAD CELL, 7.5 KG, UNSEALED
	7153-13234	MK 21 LOAD CELL, 50 KG, UNSEALED, 10 FT
8153-10283	7153-10284	MK 22 LOAD CELL, 300 LB, 3000D, 24 IN CBL
	7153-10286	MK 22 LOAD CELL, 500 LB, 2500D, 24 IN CBL
	7153-10290	MK 22 LOAD CELL, 300 LB, 3000D, 12 FT CBL
	7153-10291	MK 22 LOAD CELL, 500 LB, 2500D, 12 FT CBL
	7153-11598	MK 22 LOAD CELL, 230 KG, 2 MV/V
7153-14404	7153-14404	MK 22 LOAD CELL, 230 KG, CHRONOS
8153-14496	7153-14363	MK 23 LOAD CELL, 60 KG, 3000D
	7153-14517	MK 23 LOAD CELL, 7.5 KG, 3500D
	7153-14519	MK 23 LOAD CELL, 30 KG, 3000D
	7153-14521	MK 23 LOAD CELL, 15 KG, 3000D
	7153-14819	MK 23 LOAD CELL, 80 KG, 3000D
	7153-15335	MK 23 LOAD CELL, 30 KG, 5000D
	7153-15336	MK 23 LOAD CELL, 15 KG, 5000D
	7153-15337	MK 23 LOAD CELL, 7.5 KG, 5000D
	7153-15338	MK 23 LOAD CELL, 60 KG, 5000D

WEIGH-TRONIX / SANTA ROSA LOAD CELLS

PART NUMBER		DESCRIPTION
8153-14836	7153-14820	MK 24 LOAD CELL, 60 KG, 5000D
8153-09225	7153-09223	BAG SC LOAD CELL, 300 LB, 24 IN CBL
50000-XXXX		MK 17 LOAD CELL, 5.50 KG, 5000D
49998-XXXX		MK 18 LOAD CELL, 160 KG, 3000D
7154-16355-XXX		MK 27 & 28 LOAD CELL, 7.5 KG TO 160 KG, 5000D
52591-XXXX		MK 29 LOAD CELL, 7.5 KG TO 50 KG, 3000D

NOTICE !
CHANGES TO THIS DRAWING
REQUIRE DOCUMENT CONTROL
PRE-APPROVAL FROM
FM APPROVALS

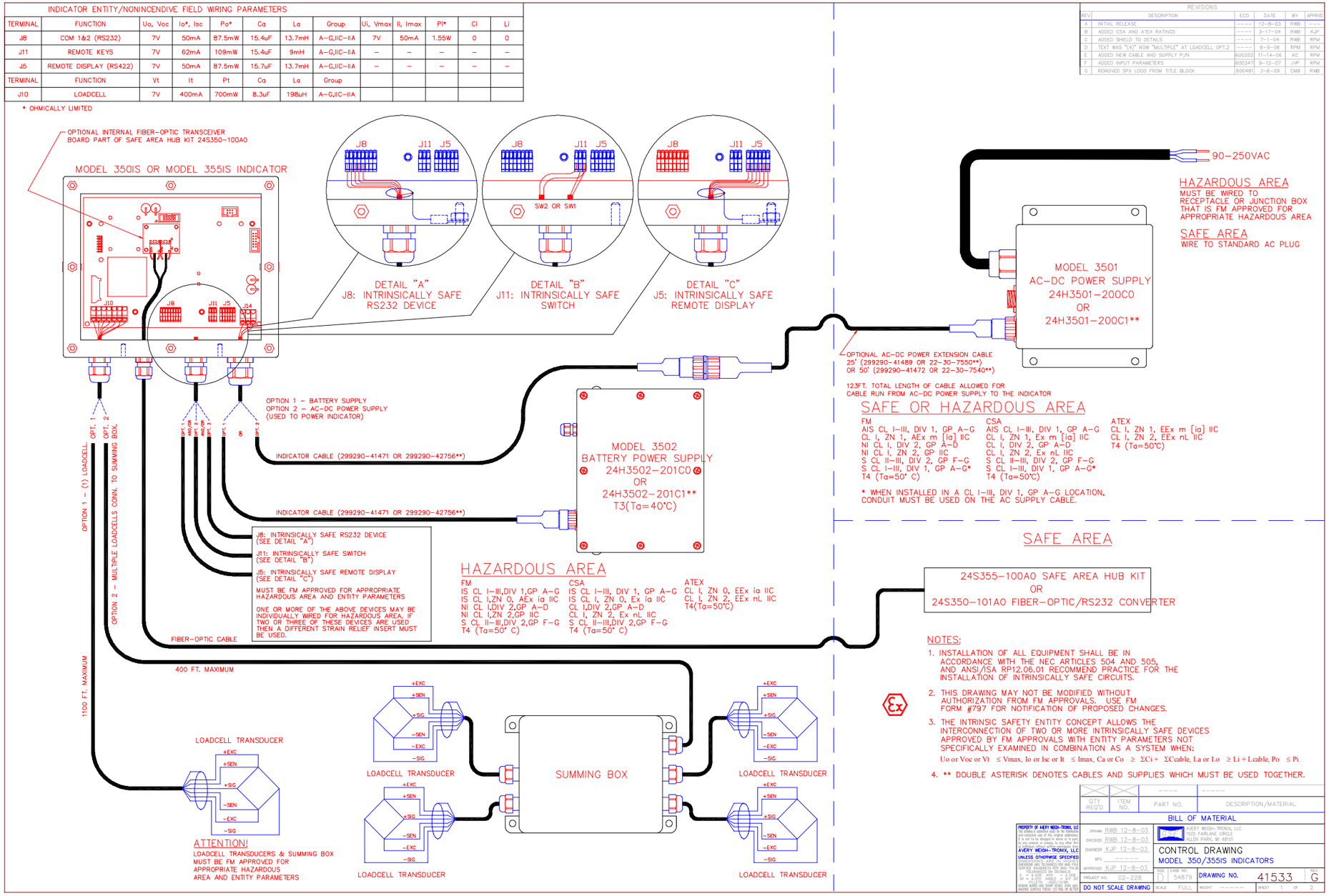
SIZE	DWG. NO.	ISSUE
D	AWT35-500389	AB
SCALE 1:1		SHEET 6 OF 6

INDICATOR ENTITY/NONINCENDIVE FIELD WIRING PARAMETERS

TERMINAL	FUNCTION	Uo, Voc	Io*, Isc	Po*	Ca	La	Group	Ui, Vmax	Ii, Imax	Pi*	Ci	Li
J8	COM 1&2 (RS232)	7V	50mA	87.5mW	15.4uF	13.7mH	A–G,IIC–IIA	7V	50mA	1.55W	0	0
J11	REMOTE KEYS	7V	62mA	109mW	15.4uF	9mH	A–G,IIC–IIA	–	–	–	–	–
J5	REMOTE DISPLAY (RS422)	7V	50mA	87.5mW	15.7uF	13.7mH	A–G,IIC–IIA	–	–	–	–	–
TERMINAL	FUNCTION	Vt	It	Pt	Ca	La	Group					
J10	LOADCELL	7V	400mA	700mW	8.3uF	198uH	A–G,IIC–IIA					

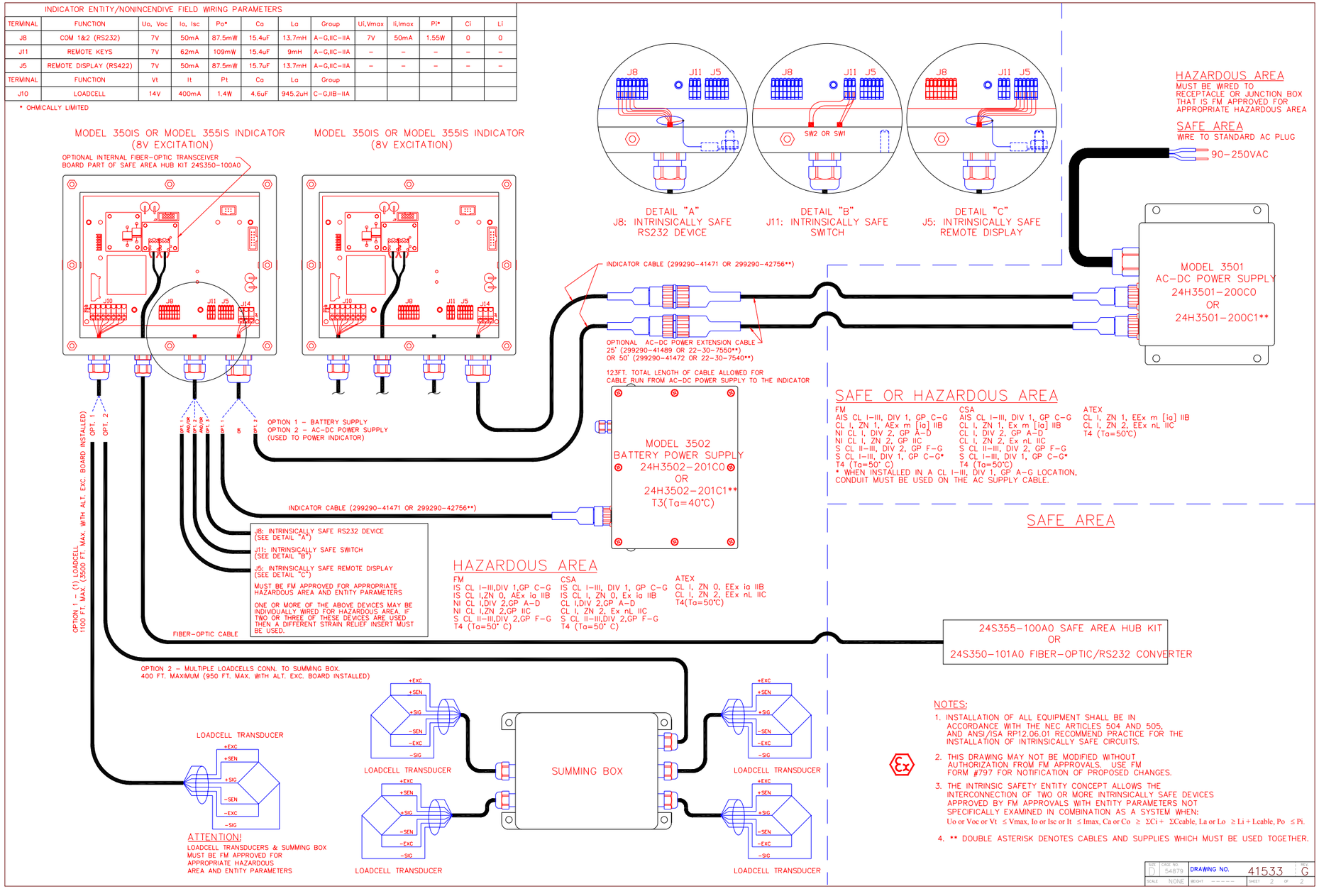
* OHMICALLY LIMITED

REVISIONS					
REV	DESCRIPTION	ECO	DATE	BY	APPRVD
A	INITIAL RELEASE	-----	12–8–03	RWB	----
B	ADDED CSA AND ATEX RATINGS	-----	3–17–04	RWB	KJP
C	ADDED SHIELD TO DETAILS	-----	7–1–04	RWB	RPM
D	TEXT WAS "(4)" NOW "MULTIPLE" AT LOADCELL OPT.2	-----	6–9–06	RPM	RPM
E	ADDED NEW CABLE AND SUPPLY P/N	600252	11–14–06	KC	RPM
F	ADDED INPUT PARAMETERS	600347	9–12–07	JAF	RPM
G	REMOVED SPX LOGO FROM TITLE BLOCK	600491	3–6–09	CMB	RWB


OPTIONAL INTERNAL FIBER–OPTIC TRANSCEIVER BOARD PART OF SAFE AREA HUB KIT 24S350–100A0
MODEL 350IS OR MODEL 355IS INDICATOR
J8
J11 J5
SW2 OR SW1
DETAIL "A" J8: INTRINSICALLY SAFE RS232 DEVICE
DETAIL "B" J11: INTRINSICALLY SAFE SWITCH
DETAIL "C" J5: INTRINSICALLY SAFE REMOTE DISPLAY
90–250VAC
HAZARDOUS AREA
MUST BE WIRED TO RECEPTACLE OR JUNCTION BOX THAT IS FM APPROVED FOR APPROPRIATE HAZARDOUS AREA
SAFE AREA
WIRE TO STANDARD AC PLUG
MODEL 3501 AC–DC POWER SUPPLY 24H3501–200C0 OR 24H3501–200C1**
OPTIONAL AC–DC POWER EXTENSION CABLE 25' (299290–41489 OR 22–30–7550**) OR 50' (299290–41472 OR 22–30–7540**)
123FT. TOTAL LENGTH OF CABLE ALLOWED FOR CABLE RUN FROM AC–DC POWER SUPPLY TO THE INDICATOR
SAFE OR HAZARDOUS AREA
FM
AIS CL I–III, DIV 1, GP A–G
CL I, ZN 1, AEx m [ia] IIC
NI CL I, DIV 2, GP A–D
NI CL I, ZN 2, GP IIC
S CL II–III, DIV 2, GP F–G
S CL I–III, DIV 1, GP A–G*
T4 (Ta=50° C)
CSA
AIS CL I–III, DIV 1, GP A–G
CL I, ZN 1, Ex m [ia] IIC
CL I, DIV 2, GP A–D
CL I, ZN 2, Ex nL IIC
S CL II–III, DIV 2, GP F–G
S CL I–III, DIV 1, GP A–G*
T4 (Ta=50°C)
ATEX
CL I, ZN 1, EEx m [ia] IIC
CL I, ZN 2, EEx nL IIC
T4 (Ta=50°C)
* WHEN INSTALLED IN A CL I–III, DIV 1, GP A–G LOCATION, CONDUIT MUST BE USED ON THE AC SUPPLY CABLE.
OPTION 1 – BATTERY SUPPLY
OPTION 2 – AC–DC POWER SUPPLY (USED TO POWER INDICATOR)
INDICATOR CABLE (299290–41471 OR 299290–42756**)
INDICATOR CABLE (299290–41471 OR 299290–42756**)
MODEL 3502 BATTERY POWER SUPPLY 24H3502–201C0 OR 24H3502–201C1** T3(Ta=40°C)
OPT. 1
OPT. 2
OPTION 1 – (1) LOADCELL
OPTION 2 – MULTIPLE LOADCELLS CONN. TO SUMMING BOX.
1100 FT. MAXIMUM
J8: INTRINSICALLY SAFE RS232 DEVICE (SEE DETAIL "A")
J11: INTRINSICALLY SAFE SWITCH (SEE DETAIL "B")
J5: INTRINSICALLY SAFE REMOTE DISPLAY (SEE DETAIL "C")
MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
ONE OR MORE OF THE ABOVE DEVICES MAY BE INDIVIDUALLY WIRED FOR HAZARDOUS AREA. IF TWO OR THREE OF THESE DEVICES ARE USED THEN A DIFFERENT STRAIN RELIEF INSERT MUST BE USED.
HAZARDOUS AREA
FM
IS CL I–III,DIV 1,GP A–G
IS CL I,ZN 0, AEx ia IIC
NI CL I,DIV 2,GP A–D
NI CL I,ZN 2,GP IIC
S CL II–III,DIV 2,GP F–G
T4 (Ta=50° C)
CSA
IS CL I–III, DIV 1, GP A–G
IS CL I, ZN 0, Ex ia IIC
CL I,DIV 2,GP A–D
CL I, ZN 2, Ex nL IIC
S CL II–III,DIV 2,GP F–G
T4 (Ta=50° C)
ATEX
CL I, ZN 0, EEx ia IIC
CL I, ZN 2, EEx nL IIC
T4(Ta=50°C)
FIBER–OPTIC CABLE
400 FT. MAXIMUM
SAFE AREA
24S355–100A0 SAFE AREA HUB KIT OR 24S350–101A0 FIBER–OPTIC/RS232 CONVERTER
LOADCELL TRANSDUCER
+EXC
+SEN
+SIG
–SEN
–EXC
–SIG
SUMMING BOX
ATTENTION!
LOADCELL TRANSDUCERS & SUMMING BOX MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
NOTES:
1. INSTALLATION OF ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH THE NEC ARTICLES 504 AND 505, AND ANSI/ISA RP12.06.01 RECOMMEND PRACTICE FOR THE INSTALLATION OF INTRINSICALLY SAFE CIRCUITS.
2. THIS DRAWING MAY NOT BE MODIFIED WITHOUT AUTHORIZATION FROM FM APPROVALS. USE FM FORM #797 FOR NOTIFICATION OF PROPOSED CHANGES.
3. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO OR MORE INTRINSICALLY SAFE DEVICES APPROVED BY FM APPROVALS WITH ENTITY PARAMETERS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN:
Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or Co ≥ ΣCi + ΣCcable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
4. ** DOUBLE ASTERISK DENOTES CABLES AND SUPPLIES WHICH MUST BE USED TOGETHER.
QTY REQ'D | ITEM NO. | PART NO. | DESCRIPTION/MATERIAL
BILL OF MATERIAL
PROPERTY OF AVERY WEIGH–TRONIX, LLC
AVERY WEIGH–TRONIX, LLC 1525 FAIRLANE CIRCLE ALLEN PARK, MI 48101
DRAWN RWB 12–8–03
CHECKED RWB 12–8–03
ENGINEER KJP 12–8–03
MFG
APPROVED KJP 12–8–03
PROJECT NO. 02–228
DO NOT SCALE DRAWING
CONTROL DRAWING
MODEL 350/355IS INDICATORS
SIZE D
CAGE NO. 54679
DRAWING NO. 41533
REV. G
SCALE FULL
WEIGHT
SHEET 1 OF 2

INDICATOR ENTITY/NONINCENDIVE FIELD WIRING PARAMETERS												
TERMINAL	FUNCTION	Uo, Voc	Io, Isc	Po*	Ca	La	Group	Ui,Vmax	Ii,Imax	Pi*	Ci	Li
J8	COM 1&2 (RS232)	7V	50mA	87.5mW	15.4uF	13.7mH	A-G,IIC-IIA	7V	50mA	1.55W	0	0
J11	REMOTE KEYS	7V	62mA	109mW	15.4uF	9mH	A-G,IIC-IIA	–	–	–	–	–
J5	REMOTE DISPLAY (RS422)	7V	50mA	87.5mW	15.7uF	13.7mH	A-G,IIC-IIA	–	–	–	–	–
TERMINAL	FUNCTION	Vt	It	Pt	Ca	La	Group					
J10	LOADCELL	14V	400mA	1.4W	4.6uF	945.2uH	C-G,IIB-IIA					

* OHMICALLY LIMITED


MODEL 350IS OR MODEL 355IS INDICATOR (8V EXCITATION)
OPTIONAL INTERNAL FIBER-OPTIC TRANSCEIVER BOARD PART OF SAFE AREA HUB KIT 24S350-100A0
MODEL 350IS OR MODEL 355IS INDICATOR (8V EXCITATION)
DETAIL "A" J8: INTRINSICALLY SAFE RS232 DEVICE
DETAIL "B" J11: INTRINSICALLY SAFE SWITCH
SW2 OR SW1
DETAIL "C" J5: INTRINSICALLY SAFE REMOTE DISPLAY
HAZARDOUS AREA
MUST BE WIRED TO RECEPTACLE OR JUNCTION BOX THAT IS FM APPROVED FOR APPROPRIATE HAZARDOUS AREA
SAFE AREA
WIRE TO STANDARD AC PLUG
90-250VAC
MODEL 3501 AC-DC POWER SUPPLY 24H3501-200C0 OR 24H3501-200C1**
INDICATOR CABLE (299290-41471 OR 299290-42756**)
OPTIONAL AC-DC POWER EXTENSION CABLE 25' (299290-41489 OR 22-30-7550**) OR 50' (299290-41472 OR 22-30-7540**)
123FT. TOTAL LENGTH OF CABLE ALLOWED FOR CABLE RUN FROM AC-DC POWER SUPPLY TO THE INDICATOR
SAFE OR HAZARDOUS AREA
FM
AIS CL I-III, DIV 1, GP C-G
CL I, ZN 1, AEx m [ia] IIB
NI CL I, DIV 2, GP A-D
NI CL I, ZN 2, GP IIC
S CL II-III, DIV 2, GP F-G
S CL I-III, DIV 1, GP C-G*
T4 (Ta=50° C)
CSA
AIS CL I-III, DIV 1, GP C-G
CL I, ZN 1, Ex m [ia] IIB
CL I, DIV 2, GP A-D
CL I, ZN 2, Ex nL IIC
S CL II-III, DIV 2, GP F-G
S CL I-III, DIV 1, GP C-G*
T4 (Ta=50°C)
ATEX
CL I, ZN 1, EEx m [ia] IIB
CL I, ZN 2, EEx nL IIC
T4 (Ta=50°C)
* WHEN INSTALLED IN A CL I-III, DIV 1, GP A-G LOCATION, CONDUIT MUST BE USED ON THE AC SUPPLY CABLE.
MODEL 3502 BATTERY POWER SUPPLY 24H3502-201C0 OR 24H3502-201C1** T3(Ta=40°C)
OPTION 1 - BATTERY SUPPLY
OPTION 2 - AC-DC POWER SUPPLY (USED TO POWER INDICATOR)
INDICATOR CABLE (299290-41471 OR 299290-42756**)
OPTION 1 - (1) LOADCELL 1700 FT. MAX. (3500 FT. MAX. WITH ALT. EXC. BOARD INSTALLED)
OPT. 1
OPT. 2
J8: INTRINSICALLY SAFE RS232 DEVICE (SEE DETAIL "A")
J11: INTRINSICALLY SAFE SWITCH (SEE DETAIL "B")
J5: INTRINSICALLY SAFE REMOTE DISPLAY (SEE DETAIL "C")
MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
ONE OR MORE OF THE ABOVE DEVICES MAY BE INDIVIDUALLY WIRED FOR HAZARDOUS AREA. IF TWO OR THREE OF THESE DEVICES ARE USED THEN A DIFFERENT STRAIN RELIEF INSERT MUST BE USED.
HAZARDOUS AREA
FM
IS CL I-III,DIV 1,GP C-G
IS CL I,ZN 0, AEx ia IIB
NI CL I,DIV 2,GP A-D
NI CL I,ZN 2,GP IIC
S CL II-III,DIV 2,GP F-G
T4 (Ta=50° C)
CSA
IS CL I-III, DIV 1, GP C-G
IS CL I, ZN 0, Ex ia IIB
CL I,DIV 2,GP A-D
CL I, ZN 2, Ex nL IIC
S CL II-III,DIV 2,GP F-G
T4 (Ta=50° C)
ATEX
CL I, ZN 0, EEx ia IIB
CL I, ZN 2, EEx nL IIC
T4(Ta=50°C)
SAFE AREA
FIBER-OPTIC CABLE
24S355-100A0 SAFE AREA HUB KIT OR 24S350-101A0 FIBER-OPTIC/RS232 CONVERTER
OPTION 2 - MULTIPLE LOADCELLS CONN. TO SUMMING BOX. 400 FT. MAXIMUM (950 FT. MAX. WITH ALT. EXC. BOARD INSTALLED)
LOADCELL TRANSDUCER
+EXC
+SEN
+SIG
-SEN
-EXC
-SIG
SUMMING BOX
ATTENTION!
LOADCELL TRANSDUCERS & SUMMING BOX MUST BE FM APPROVED FOR APPROPRIATE HAZARDOUS AREA AND ENTITY PARAMETERS
NOTES:
1. INSTALLATION OF ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH THE NEC ARTICLES 504 AND 505, AND ANSI/ISA RP12.06.01 RECOMMEND PRACTICE FOR THE INSTALLATION OF INTRINSICALLY SAFE CIRCUITS.
2. THIS DRAWING MAY NOT BE MODIFIED WITHOUT AUTHORIZATION FROM FM APPROVALS. USE FM FORM #797 FOR NOTIFICATION OF PROPOSED CHANGES.
3. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO OR MORE INTRINSICALLY SAFE DEVICES APPROVED BY FM APPROVALS WITH ENTITY PARAMETERS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN:
Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or Co ≥ ΣCi + ΣCcable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
4. ** DOUBLE ASTERISK DENOTES CABLES AND SUPPLIES WHICH MUST BE USED TOGETHER.
SIZE D
CAGE NO. 54879
DRAWING NO. 41533
REV G
SCALE NONE
WEIGHT ------
SHEET 2 OF 2

Avery Weigh-Tronix

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